DOCUMENT RESUME

ED 457 349 CE 082 361

AUTHOR	McIntosh, Steven; Steedman, Hilary
TITLE	Low Skills: A Problem for Europe.
INSTITUTION	London School of Economics and Political Science (England). Centre for Economic Performance.
PUB DATE	2000-00-00
NOTE	86p.; Final Report to DGXII of the European Commission on the NEWSKILLS Programme of Research "Education and Training: New Job Needs and the Low-Skilled." Funded under the Fourth Framework Programme for Targeted Socio-Economic Research.
CONTRACT	ERB-SOE2-CT-95-2006(TSER)
AVAILABLE FROM	For full text: http://cep.lse.ac.uk/homepage/tser/finalreport.pdf.
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Access to Education; Adult Basic Education; *At Risk Persons; *Basic Skills; Developed Nations; Education Work Relationship; Educational Attainment; Educational Mobility; *Educational Policy; *Educationally Disadvantaged; Employment Patterns; Employment Qualifications; Foreign Countries; Labor Market; *Labor Needs; Lifelong Learning; Older Adults; Older Workers; Outcomes of Education; Retraining; Skill Development; Technological Advancement; *Unskilled Occupations
IDENTIFIERS	France; Germany; Netherlands; Portugal; Sweden; United Kingdom; Work Based Learning

ABSTRACT

In order to develop conclusions about future policy aimed at addressing the challenge of workers at risk because of low skills, the NEWSKILLS project combined scientific analysis with consultation with social partner representatives, policy analysis, and field work in firms. Population proportions in International Standard Classification of Education (ISCED) 0-2 group (those who had completed lower secondary or less education) varied widely among European countries. In all countries, the proportion of adults in the 0-2 group declined from 1985-95 resulting predominantly from more young people receiving further education and training. Adult upgrading from ISCED 0-2 remained the exception. Measured by duration, the low skill group received less employer-provided education and training than higher skill groups. The 0-2 group's labor market position declined over the same period relative to the national average. Technological change explained much of the decline in labor market demand for the group without further education and training. Older workers without full lower secondary education were at greatest risk. Increased expectations in social competence and communication resulting from growth of service economy employment was found. Suggestions were to frame education policy in terms of entitlement to a minimum level and not only to an entitlement of years of education. (Contains 73 references.) (YLB)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 457 349

Final Report to DGXII of the European Commission on the *NEWSKILLS* Programme of Research

Education and Training: New Job Skill Needs and the Low-Skilled

Contract ERB-SOE2-CT-95-2006 (TSER)

Research funded under the Fourth Framework Programme for Targeted Socio-Economic Research

LOW SKILLS : A PROBLEM FOR EUROPE

Report prepared by Steven McIntosh and Hilary Steedman, Centre for Economic Performance, London School of Economics, with the assistance and contributions from members of the *NEWSKILLS* research group

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
● Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
H. Steedman
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

BEST COPY AVAILABLE

82361

LOW SKILLS: A PROBLEM FOR EUROPE

Contents

ABSTRACT

1. EXECUTIVE SUMMARY

2.BACKGROUND AND OBJECTIVES OF THE PROJECT

3.SCIENTIFIC DESCRIPTION OF THE PROJECT RESULTS AND METHODOLOGY

4.CONCLUSIONS AND POLICY IMPLICATIONS

5. DISSEMINATION AND/OR EXPLOITATION OF RESULTS

6. ACKNOWLEDGMENTS AND REFERENCES

7. APPENDICES

ABSTRACT

The NEWSKILLS project uses econometric and other social science investigative techniques to document and analyse supply and demand factors affecting the group without further education and training (ISCED 0-2) on European labour markets. Consultation with social partner representatives, policy analysis and field work in firms was then added to the scientific analysis to develop conclusions about future policy to address the challenge of the group at risk from low skills. Population proportions in the ISCED 0-2 group were found to vary widely between European countries studied (France, the Netherlands, Portugal, Sweden and the UK). In every country the attainments of the group were more heterogeneous than for the higher ISCED levels and in all countries except Portugal around half were in employment. In all countries the proportion in the at risk group (ISCED 0-2) declined over the decade 1985-1995 but rates of growth varied between countries. Those with the largest at risk groups had below average growth in skills. This decline was predominantly the result of more young people receiving further education and training; adult upgrading from ISCED 0-2 remained the exception. The increase in growth of qualified young people occurred earlier in some countries than others and could not be decisively linked to labour market factors. Improvement in average attainments at the end of lower secondary education proved more closely linked with increased post-compulsory participation. Measured by duration, the at- risk group received less employer-provided education and training than higher skill groups except in Germany where apprenticeship dominates such provision. But a further study indicated that more /different incentives are needed to overcome the reluctance of the low-skilled to accept employer-provided training. Despite the decline in the proportions in the at risk group their labour market position declined over the same period relative to the national average (more unemployment and inactivity). Those in employment were more likely to be employed in sectors having declining employment during the 1990s than those in the higher skill groups in all countries except Portugal. However, for those in employment, including those who took a new job 1985-1995, job quality did not decline to any significant extent. Technological change was found to explain much of the change in labour market demand for the group without further education and training in a study using Swedish data. Older workers without full lower secondary education were at greatest risk. Case-studies of firms which had large proportions of employees without further education and training revealed marked differences in employer demand for the ISCED 0-2 group between countries. Where employers were seeking to recruit from this group there was particular concern about social skills and basic employability. Evidence was found of an increase in expectations in the area of social competence and communication resulting from the growth of service economy employment. No evidence was found from any of the studies that demand for this group would fall dramatically in the short term. However, the message of rising expectations and inadequate basic preparation was also strongly repeated at a meeting of representatives of the social partners dedicated to discussing these issues. In particular it was stressed that attitude changes are necessary to enable European countries to move towards a situation where all have access to and can benefit from a 'minimum learning platform'. Education policy should be framed in terms of entitlement to a minimum level and not only to an entitlement of 'years' of education. The institutions of learning should be diversified and become more flexible. Finally, European citizenship should be defined as entailing commitment from the individual citizen to investment in learning throughout life, matched by a commitment to flexible and appropriate provision from employers, and public and private providers. All the countries studied are developing a variety of strategies and policies which provide the first steps towards establishing a minimum learning entitlement. Some are more advanced than others. The work of the NEWSKILLS project now turns to promoting further debate of these movements and to disseminating greater understanding of the fundamental social changes which underpin them.

1.EXECUTIVE SUMMARY

THE AIMS OF THE RESEARCH PROGRAMME

By the beginning of the 1990s in Europe it was becoming clear that an unprecedented change had overtaken the low-skilled on the labour market. Compared to the position at the beginning of the 1970s, the gap between the earnings of the low-skilled and the higher-skilled had widened in a majority of EU countries and in Canada and the US. This trend resulted from large real wage gains at the top of the earnings scale and stagnant real wages at the lower end of the distribution (Machin 1998). In the United States where the labour market is more deregulated than in Europe and welfare less generous, the low-skilled group experienced a *fall* in real wages In all of the EU countries included in the *NEWSKILLS* analysis except for Germany, earnings differentials widened over the period 1980-1995. In France, the Netherlands and Sweden the change was only slight, but in the UK and in Portugal the change was relatively large.[1]

In all industrialised countries from the late 1970s onwards the low-skilled were increasingly likely to experience spells of unemployment - in particular long-term unemployment (OECD1994). In the flexible US economy this falling demand was reflected in falling real wages. In the more regulated European economies the wages of the low-skilled were kept artificially high at a price which meant that demand for the low-skilled fell (OECD op.cit.).

The conclusion of economists studying the question was that the causes of the deterioration were structural and were therefore unlikely to be removed simply as a result of improvements in economic growth resulting from the normal fluctuations of the business cycle (see Chapter 2 for an overview of recent literature).

A policy-oriented, problem-solving approach to research

The NEWSKILLS research project started, therefore, from a concern to bring academically rigorous research techniques to bear on a pressing social, educational and economic problem - namely the changing situation of the low-skilled on the labour market. The first aim was to understand better the change in the proportions of low-skilled on the labour market over the period 1985-1995. The second aim was to investigate the extent to which employers' demand for the low-skilled was falling and why. The third aim was to investigate factors affecting the supply of skills, in particular low-skilled adults in the workforce. It was then planned that findings from research studies should be 'put to the test' in a forum of policy makers, employer and employee representatives, and in a series of case studies of firms employing low-skilled labour. On the basis of our own research and this consultations process we hoped to put forward some principles which could underpin a 'platform for learning' which could be promoted throughout Europe to help raise the potential of those with low or no qualifications on the labour market. The outcomes of all these activities should be proposals and conclusions of interest to policy makers.

---

[1] Change in the differential is measured as change in the ratio of the average earnings of those in the 90th earnings percentile:average earnings of those in the 10th earnings percentile. Data taken from OECD *Employment Outlook* 1996.

SUMMARY OF FINDINGS
Measures of skill and terminology

The ISCED classification adopted

Since the aim of the project was to establish the extent of 'low skills' in a range of European countries, we first needed to agree on a definition which could serve the needs of our research. For the purposes of quantitative analysis, we needed an agreed basis for the assignment of each country's qualifications as recorded in the national surveys to be used in our work. The International Standard Classification of Education (ISCED) was the obvious choice.

Selecting a proxy for low skills

On the ISCED scale the 0-1 group is defined as those having complete or incomplete primary education or incomplete lower secondary education as their highest qualification. Since this group consists of individuals who have had very restricted educational opportunities, we tested to ascertain whether the ISCED 0-1 group would be suitable as a proxy for low skills. Differences between countries in proportions at ISCED 0-1 were very great and varied between countries. At one extreme Germany had around 5 per cent at this level while Portugal had nearly 50 per cent. We next examined the ISCED 0-2 group (which includes ISCED 0-1) but adds all those with complete lower secondary education. We found that differences between countries in proportions at this level persisted but that these were not so extreme as for ISCED 0-1[24]. Evidence from the OECD (Employment Outlook 1997) showed large differences in likelihood of employment by ISCED level; in particular the ISCED 0-2 group had a much lower likelihood of employment than the ISCED 3 group. For all these reasons it was decided not to restrict the low skills group to ISCED 0-1 but to identify the low skills group as the group classified in each country to ISCED 0-2. This restricted the group to all those who had left formal full-time education after completion of the period of compulsory education.

ISCED 0-2 and International Adult Literacy Survey (IALS) scores

Using the IALS skills measures as a calibrating instrument it was found that ISCED levels were correlated with IALS to a similar degree across countries [24]. This increased our confidence that our skills measures were at least reasonably consistent across countries. Most of those at IALS Level 1 were found in the ISCED 0-2 category and two thirds of those at ISCED 0-2 were at IALS Levels 1 and 2. This suggests that, while the ISCED 0-2 category is far from homogeneous - for every country, the standard deviation of IALS scores was largest within the ISCED 0-2 group - a large majority of those grouped at this level perform at the IALS levels recognised as the most basic. However, it should not be forgotten that in that in every country some of those classified to this level hold middle and high-level jobs; in all countries half or over half are in employment. But there are large between-country differences in the size and - linked with size - the composition of the ISCED 0-2 group.

Attainments on completion of ISCED 2 stage of education

A secondary analysis of scores from the Third International Mathematics and Science Study (TIMSS) was carried out as part of the work of testing the reliability of the ISCED proxy for low skills [24]. In this analysis basic mathematics skill levels at the end of compulsory education in the European countries in the *NEWSKILLS* study were compared in order to benchmark the ISCED 0-2 level in Europe against a world best standard and to assess how adequate the European ISCED 0-2 attainments in basic skills might be for modern working life. It was estimated that only in Sweden and France would performance approach that of the benchmark country (Singapore) with at least 90 per cent of all 16 year olds able to answer half of thirty basic mathematics questions from the TIMSS study. It was estimated that for other countries - Germany, Portugal, the Netherlands and the UK - 90 per cent correct answers could be provided for only a quarter of the test questions at age 16. The findings of this study support the view that, for a substantial proportion of those who leave education at the end of the ISCED 2 stage (ie at the end of compulsory education), basic mathematics skills are likely to be inadequate for employability and as a basis for future skills upgrading.

The supply of skills 1985-1997

Changes in stocks and predicted change to 2010

We found that in all countries in the study the group defined as ISCED 0-2 declined over the period 1985-1997 although at differing rates [21]. This decline has occurred almost entirely as a result of the entrance onto the labour market of better-qualified young people and not as a result of the upgrading of the qualifications of the adult workforce. Since stocks differed considerably between countries in 1985 these differing rates of change have brought about only limited convergence in proportions with ISCED 0-2 . Extrapolation (based on average annual growth 1990-1997/8) predicts that in Sweden and Germany the ISCED 0-2 group will fall to around fifteen per cent by the year 2010 as older workers leave the population of working age and younger, better-educated workers take their place. But in the Netherlands and France just under a third of the population will still be at this level, in the UK over one third and in Portugal over two thirds will still be at ISCED 0-2.

The effect of technological change

Since it is concluded from our study of manufacturing in Sweden that technological change can be shown to explain much of the fall in demand for the ISCED 0-2 group [20], there is reason to suppose that the intermediate skills group will also start to be affected as technological change continues. Indeed, a further study of young people on the labour market in Sweden shows that unemployment is now (1997) beginning to affect groups with ISCED 3 qualifications that previously enjoyed good employment opportunities. We conclude that skill demand resulting from technological change will probably continue to grow and that the both the ISCED 0-2 and the ISCED 3 group will experience pressure to participate in skill upgrading. As a consequence we may find that, in contrast to the past and present situation, it will be necessary for larger proportions of education and training qualifications to be acquired in adult life and that education levels are not fixed only during the period of initial education. Since we have shown that standards of basic mathematics of many of those who leave with only ISCED 2 qualifications are inadequate as a basis for upgrading, it is essential to raise the standards of the lowest attainers in compulsory education. Only then will the whole population have the potential to build on their education.

The role of institutions in protecting the ISCED 0-2 group on the labour market

Labour market institutions differ considerably between the countries studied [4]. However, in no country studied do we find that strong labour market institutions have protected the ISCED 0-2 group from unemployment/falling wage differentials or both. However, labour market institutions have, of course, played a part in most countries in setting the price of labour. The study of Sweden, a country usually considered to have strong labour market institutions showed that supply and demand factors nevertheless operated strongly on the employment prospects of the ISCED 0-2 group. For example, the price-elasticity of demand for the ISCED 0-1 group was high with the result that the employment prospects of the ISCED 0-1 group was more sensitive to changes in wage costs than the high-skilled group [20]. The role of supply and demand together with labour market institutions in determining earnings for the different skill groups was also emphasised in the study of seven countries including Germany, the Netherlands and Sweden [11].

Comparisons of training in the workplace

We recognise that years of education are an input to skill formation and that for most individuals that input is a necessary condition for reaching a minimum skill level recognised on the labour market. Skill levels can be increased by improving the quality and amount of initial education and training received, by skill upgrading in employment or, if unemployed or inactive, through government-sponsored or non-sponsored individual learning initiatives. Informal workplace learning can also help to raise skill levels (OECD 1997a). Other projects in the Fourth Framework Programme have concentrated on training for the unemployed.[2] The *NEWSKILLS* project sought to compare volumes of training provided in European countries to individuals in the workplace [19]. Where data were satisfactory (Sweden, Germany and the UK) some important findings emerged. The least well-educated (ISCED 0-2) were least likely to receive employer-provided training. The exception was Germany where 70 per cent of training incidences are reported to be provided for this group. Most of this training was provided for young people in apprenticeship. Older employees were less likely to receive training, except in Sweden. Full-time employees were more likely to receive training than part-time employees.

Attitudes to workplace training

Insight into why the ISCED 0-2 group should receive less workplace training was provided by a study which used International Adult Literacy Survey (IALS) data on workers' and firms' decisions about training [10,14]. This analysis produced results which suggested that workers with ISCED 0-2 receive as many offers of training as other skill groups but are more reluctant to take up such offers. Explanations put forward to explain the reluctance of ISCED 0-2 groups to undertake training when offered were based on case study experience from *NEWSKILLS* and other case study work. One hypothesis advanced to explain this reluctance suggested that the group does not attach much weight to future benefits ie they have a high discount rate. Data from the case studies [3] confirmed the view that employees do not normally receive higher wages following a period of employer-provided training. The UK was the only country where the *NEWSKILLS* case studies [3] included a firm which paid higher wages to low-skilled individuals who undertook training. This lends support to the hypothesis of low incentives to participate. In our discussion, French colleagues pointed to case-study material which indicates sociological differences between the ISCED 0-2 group and other ISCED groups. These claimed that, since most school drop-outs are included in the ISCED 0-2 group, they are likely to have had an unrewarding school experience and to have therefore developed negative attitudes to learning. Training offered by employers or government training schemes will look like 'going back to school' and the consequent 'psychological cost' of overcoming negative attitudes will be higher than for ISCED groups with more positive attitudes developed during initial schooling.

---

[2] Brandsma J (1998) 'The Effectiveness of Labour Market Training for the Unemployed' Final Report to the European Commission (mimeo)

Informal workplace learning

Informal workplace learning was explored in a case study of firms in the footwear and electronics sectors in Portugal [2]. This study claims that it is possible for a traditional manufacturing sector to incorporate advanced technologies into production while employing a workforce having only traditional levels of skill (mostly ISCED 0-1). It is hypothesised that traditional craft-based skills proved a suitable foundation for the utilization of electronic production and information technology. This paper helps to explain the apparent paradox of the Portuguese economy in which demand for the ISCED 0-2 group remains high and constant over the period 1985-97. However, it is not clear that similar developments could be expected in other European countries. In those countries, the ISCED 0-1 group frequently consists of workers nearing retirement or of workers who have difficulties with the standard language of the country. Furthermore, part of Portugal's current economic success in the manufacturing sector must be attributed to labour costs which are currently around one third of the EU average (William Mercer quoted in Financial Times, June 1 1999). Our case studies [3] led us to conclude that in the EU in general, where the service economy increasingly dominates, firms need a mix of skills and that economic prosperity cannot be built principally on ISCED 0-2 skills unless circumstances are exceptional.

Why school students stay on

Levels of earnings help to explain participation in initial education and training by young people. However, when an analysis of staying on in education by 16-19 year olds in the countries in our study was carried out, the increase in levels of academic attainment at the end of the lower secondary period proved to be a key variable associated with the rise in participation [17]. A separate study of early school leavers carried out for Sweden found that those who did not proceed to upper secondary education almost all had low and/or incomplete school marks. Compared to those who continued their education despite low school marks, the early leavers also more frequently had difficult home circumstances (single-parent families) [22]. For Portugal, regional differences are found to be considerable and family poverty and the need for young family members to work to contribute to household income were important factors explaining drop-out and failure to continue in school [16].

The demand for skills 1985-1997

Decline in demand for ISCED 0-2 before 1985

Section 3 of this report includes a brief review of the literature on the wages and labour market outcomes for those in the ISCED 0-2 group over this period. From this evidence, it is clear that the 1970s and early 1980s saw a sharp decline in wages and employment of the ISCED 0-2 group. The weight of the evidence suggests that this decline was structural, ie that it resulted from changes in the demand for skills, rather than cyclical - associated with changes in the business cycle.

Negative demand as expressed in unemployment and inactivity probabilities

Overall, our evidence suggests that, with the exception of Portugal, demand for the ISCED 0-2 group has continued to fall relative to the average for all skill levels in the European countries included in our study [8]. This continuing fall is all the more serious since it has been accompanied in all countries by continuing reduction in the supply of skills at the ISCED 0-2 level [21]. Relative to the average this group has a higher risk of unemployment or inactivity in France, the UK, and the Netherlands in 1997 than in 1985. In Portugal the risk is low and in Sweden, while the

ISCED 0-2 group has a high level of inactivity and unemployment relative to the population as a whole, the level is somewhat lower in 1997 than in 1987.

Gender differences in inactivity and unemployment

Gender differences in employment likelihood are not uniform across the countries - in the UK and in France men at ISCED 0-2 have a higher likelihood of unemployment (relative to all men) than women (relative to all women) and in both countries the gap has widened slightly between 1985 and 1997. In Sweden and Portugal the situation is reversed and women in the ISCED 0-2 group have a greater likelihood of unemployment [8].

The ISCED 0-2 group in employment

The 'new jobs' study looks at demand as expressed by employers' choices when hiring new employees in the period 1985-1995. This study looks only at those in employment and must, therefore be analysed in the wider context of the continuing exclusion of around half of the group on all the labour markets studied except Portugal. The study of the quality of new jobs was carried out for the Netherlands, the UK and Portugal [12, 18]. Overall the findings point to the familiar differences between the Portuguese labour market and the labour market of the (North) European countries. In Portugal the quality and complexity of new jobs for the ISCED 0-2 group is increasing - a finding which is strongly supported in the survey of the footwear and electronics sectors in Portugal. The 'new jobs' study provides insight into what is happening to those individuals in the ISCED 0-2 group who are either in work, changing jobs or moving into employment during a ten-year period. In the UK the quality of new jobs appears stable relative to old jobs. While working conditions of the group with ISCED 0-2 have worsened in both old and new jobs, this has also been the case for the other ISCED groups. In the Netherlands, quality measured by job complexity has not worsened, although there, it must be remembered, the CEREQ study shows high but stable unemployment probabilities for the ISCED 0-2 group and very high inactivity rates. This suggests that the 'ISCED 0-2 ' group on the Dutch labour market is a relatively small and highly-selected group. Those who are in employment or moving into employment in the Netherlands may already have sufficient levels of skill to cope with the increasing job complexity noted in old jobs.

Older age groups

We found that, compared to 1985, in 1997 the likelihood of unemployment and inactivity was higher for young people (under 30) in France, the UK and the Netherlands [8]. In Portugal young people fared better than older adults and in Sweden the picture was mixed. While we took care to look at the unemployment and inactivity rates of young people compared to the whole population we did not pay as much attention to older age groups in particular the over 40s. In retrospect it appears that this would have provided some useful insights and we hope that future studies of the ISCED 0-2 group will look at the older age groups more carefully. However, the age variable was included in our study of demand in manufacturing in Sweden. In these studies it appeared that for those at the ISCED 0-1 level the experience that is accumulated with age did not appear to confer any labour market advantage (Mellander 1998). For those at the ISCED 2 level the results were more mixed but can be summed up by saying that it is easier to accumulate work experience that is valued on the labour market if you already have a good educational level [20]. Analysis of the ISCED 0-2 group according to age and performance on the IALS survey also shows that the older age groups have lower IALS scores than the younger age groups which supports the finding that their labour market experience has not contributed to raising their basic skills.

Explanations of the continuing fall in demand for ISCED 0-2

The study of demand for labour by skill carried out for Sweden strongly supports the view that the main factor explaining the continuing fall in demand for ISCED 0-2 is the continuing pace of technological change [20]. Evidence from the project which analysed changing employment shares of the ISCED 0-2 group over time shows that ISCED 0-2 individuals are under-represented in 'high-tech' manufacturing [8]. Most of the manufacturing sectors in which ISCED 0-2 individuals are over-represented are 'low-tech' and most have been contracting over the period of our study. This lends support to the thesis that increasing technological complexity is acting as a barrier to increasing employment of the ISCED 0-2 group in manufacturing. In the service sector prospects for the ISCED 0-2 group are less bleak than in manufacturing. Certain service sectors where the ISCED 0-2 group is over-represented are growing in most or all of our five EU countries (notably hotels and catering and retailing). Anecdotal evidence from our case-study firms also indicated that in some service sectors the demand for individuals with ISCED 0-2 would continue. However, except in Portugal, the ISCED 0-2 group was rarely *maintaining* its share of employment in the expanding sectors.

Progress towards a minimum learning platform in Europe

In a number of countries there is already strong evidence of interest in a 'minimum level'[26]. Naturally, this is not always the term used, but there are striking similarities between countries. In the Netherlands there has been a lively policy discussion over the last five years on the topic of the so-called 'minimum starter qualification'. In Sweden there is a tradition that the curriculum of the compulsory school should aim to provide skills necessary for daily life rather than for working life.

The identification of the importance of personal and social skills or the 'softer skills' for effectiveness in the workplace has been an important feature of the debate about a minimum learning platform over the past ten years. Adequate levels of literacy and numeracy are now seen as necessary for employability but only really effective if accompanied by a range of 'softer skills'.

In the UK, employer organisations have taken the lead in emphasising the importance of these skills. From September 2000, all post-16 students, those studying an 'academic' as well as those studying a vocational course will be encouraged to obtain a qualification in specified Key Skills. In 1999 a report entitled 'A Fresh Start – Improving Literacy and Numeracy' was published by a government-appointed commission chaired by Sir Claus Moser (The Moser Report). This led to a number of recommendations; most notable in this context is the proposal that, for the first time, a National Basic Skills Curriculum for Adults should be defined with a range of levels clearly defined. This curriculum would concentrate on the three main key skills set out above

In Portugal, researchers working with the Ministry of Education have defined the desired profile of a young person at the end of 12 years of education. This profile stresses citizenship, and social skills as well as academic attainments and has acted as a guide to the development of the curriculum. In France targets have been set which have as their aim that all young people should obtain some qualification following compulsory schooling.

In all the countries considered here, some points of convergence are already apparent.

- Communication in all its forms including quantitative literacy and self -presentational skills are now considered to be necessary for employability. This requires a solid foundation of language competence and knowledge of basic mathematics.

- In non-English speaking countries some ability to work in a foreign language, normally English is increasingly required - and achieved - for most employees.

- In all countries emphasis is placed on familiarity and basic understanding of Information and Communication Technology (ICT).

Personal and social skills are increasingly valued - these include

- The ability to learn independently
- The capacity to react to and deal effectively with uncertainty and unpredictability in the work environment
- The capacity to manage interpersonal relations successfully
- The ability to manage time and own work in an autonomous manner

The approaches adopted in trying to define a 'minimum platform' differ widely across countries. Differences are also emerging in the role that the education system is expected to play. Finally, we can also detect differences of emphasis on the respective roles of government and business and industry in delivering a minimum platform. These are illustrated in the case study material from visits to firms collected for the project [3] and in the policy discussion with representatives of the social partners which took place at CEDEFOP Thessaloniki and reported in *Agora IV The low-skilled on the European labour market: prospects and policy options - towards a minimum learning platform* IV [1].

IMPLICATIONS OF RESEARCH FOR FUTURE POLICY

From the work of the *NEWSKILLS* group we conclude that the labour market situation of the low-skilled in Europe remains difficult with high levels of exclusion. The trend towards increased exclusion has continued into the 1990s and we see no indication that the situation will be reversed in the coming decade. Indeed, the latest indications are that it may be again be accelerating.

Improvements in the education and training levels of young people have not prevented a worsening of the situation for the low-skilled. Even at present growth rates, in most European countries at least 20 per cent of the population will continue to fall into this category well into the next millennium. As a consequence, the employment prospects of the low-skilled and associated social inequality will continue to pose a major problem for Europe over the coming decade.

The findings of our programme of research inevitably point to a number of policy failures. These were emphasised further at the meeting with the social partners.

The first major policy failure that needs to be addressed is that schools in all European countries are continuing to produce young people inadequately equipped or prepared to take advantage of further education and training.

What is worse, some of those who leave initial education have developed an aversion to learning as a result of their school experiences and the disastrous results of this are seen in the reluctance to 'go back to school' to acquire further education and training in later life.

The period of basic (usually compulsory) education should not be primarily concerned with selection for higher levels of education. Schools need to focus more on ensuring a minimum level for all and on maintaining high levels of self-esteem during the period of compulsory education

An equally serious policy failure has occurred at the level of education and training for mature adults. Few older people have improved their qualifications. Most improvement in the qualifications of the labour force have occurred as a result of the entrance of better-qualified young people. The formal adult education system fails, because it replicates the school system and is not appealing to low-skilled individuals already in employment. We therefore must not just provide training, but also address the low demand for training - supply does not create its own demand.

As emphasised in the main body of our report, there are substantial differences between European countries in the size of the low-skilled group in the population, its age composition and degree of variability of attainment within the group. From this we conclude that there can be no 'one size fits all' recommendation as to the specification of a minimum platform or as to its implementation.

Countries differ in the degree to which they have tackled prevention and remediation. For example Sweden has good policies in the area of prevention but does not do so well on remediation. In France the reverse is the case. We therefore conclude that we need a set of policies that are flexible enough to enable the different European countries to produce policies 'tailor-made' to address their own set of problems and challenges.

For that reason, we do not seek to set out a simple 'blueprint' for a minimum platform for Europe. Instead, we point to the policy failures that must be addressed and identify weaknesses in current incentive structures that need to be rectified. We then indicate the features that a minimum learning platform policy should incorporate and the strategies that need to be considered for the policy to be effective.

A minimum platform should not just be concerned with the set of skills currently defined as 'employability'. Roberto Carneiro in a paper contributed to the Agora IV seminar [1] considers that 'A minimum learning platform is not a simple technical target..... It deals with all aspects of the human condition... A minimum learning platform is that **threshold level** - translated into knowledge and basic understanding of humankind - that allows for a personal quest for meaning'.[3] Furthermore, a minimum platform should be informed by the set of values that individuals in all countries share by virtue of their European citizenship, in particular respect for human rights, the rule of law and democratic decision-making.

---

[3] This section of the report owes a great deal to the paper contributed to the Agora IV Seminar Carneiro R 'Achieving a Minimum Learning Platform for All - Critical Queries Influencing Strategies and Policy Options'

Policy also needs to take account of the current state of transition of European societies from an industrial mode of production to a knowledge-based society with the new skill requirements and new learning and information infrastructures that accompany that transition. Our case studies in companies [3] have yielded much evidence that failure to develop certain personal qualities and social skills can be barriers to employment as well as handicaps in everyday life.

Finally, a minimum learning platform should be inclusive, ie open to all. This is perhaps the area where policy needs to be most radically rethought since the traditional approach to education has been characterised in a number of countries by successive exclusion at different stages of education and selectivity based on performance.

Policies need to ensure a learning entitlement for all citizens which will make access to a minimum platform a realistic possibility regardless of conventional institutional constraints. This means that learning must be provided and supported not only during the early years of life but throughout life; it must not only be available in 'school' settings but outside the conventional settings, for example in the workplace, the home and the shopping centre.

Learning must be facilitated not just by the traditional teacher-pupil relationship but using the potential of new information and presentation technologies. Using these technologies the tyranny of time and distance can be overcome and more attractive and flexible learning opportunities provided. The potential of private initiatives and enterprise to respond to learning needs should be liberated. Firms and schools or other learning providers acting in concert or in co-operative ventures could help to provide a curriculum which promotes more and better learning for the disaffected.

Finally, the new learning structures and incentives outlined above should then form the basis for a permanent paradigm shift to a new social contract where the *right* to education is complemented by a *new civic and social obligation* to undertake learning and self development throughout life.

KEY TO NEWSKILLS PAPERS AND ARTICLES REFERRED TO IN EXECUTIVE SUMMARY

CEDEFOP (2000) *Agora IV The low-skilled on the European labour market: prospects and policy options - towards a minimum learning platform* CEDEFOP Panorama, Luxembourg [1]

Carneiro R and Conceiçào P (1999) 'Learning-by-Doing and Formalized Learning: A Case Study of Contrasting Development Patterns in Portuguese Industry' Working Paper 1009, Centre for Economic Performance, London School of Economics [2]

Houtkoop W (1999a) 'The Position of the Low-Skilled in Firms' Max Goote Centre, University of Amsterdam, mimeo [3]

Kazamaki Ottersten E (1997) 'Labour Demand: An Institutional Approach' Mimeo, The Research Institute of Industrial Economics, Stockholm [4]

Kazamaki Ottersten E (1998) 'Labour Market Conditions, Wage Bargaining and Education Policies: A Note' Mimeo, The Research Institute of Industrial Economics, Stockholm [5] (to follow)

Kazamaki Ottersten E, Lindh T and Mellander E (1999) 'Evaluating Firm Training, Effects on Performance and Labour Demand' *Applied Economic Letters*, 6, 431-437 [6]

Kirsch (1998) "Low Training Levels on European Labour Markets : Convergence and Contrasts", *Training and Employment* n° 34, Céreq, Marseille [7]

Kirsch (1999a) "Devenir des bas niveaux de qualification: comparaison des situations nationales" mimeo CEREQ, Marseille [8](to follow)

Kirsch (1999b) "Niveau de formation et marché du travail : l'Europe des contrastes", Bref n° 151, Céreq, Marseille [9]

Leuven E and Oosterbeek H (1997) "Demand and supply of work-related training: Evidence from four countries", Tinbergen Institute Discussion Papers 97-013/3 [10]

Leuven E, Oosterbeek H, and van Ophem H (1998a) "Explaining International Differences in Male Wage Inequality by Differences in Demand and Supply of Skill" Centre for Economic Performance Discussion Paper No. 392, May [11]

Leuven E and Oosterbeek H (1998b) " The Quality of New Jobs for the Low-Skilled in Europe" mimeo, Faculty of Economics, University of Amsterdam [12]

Leuven E and Oosterbeek H (1998c) "An Explicit Sharing Rule for Firm-specific Human Capital Investments" mimeo, Faculty of Economics, University of Amsterdam [13]
Leuven E and Oosterbeek H (1999) "Demand and supply of work-related training: Evidence from five countries (Results for the United Kingdom)" Mimeo [14]

Lages M (1997) 'The Output of the School System in Portugal: Facts, Figures and Issues' Mimeo, CEPCEP, Catholic University of Portugal, Lisbon [15]

Lages M (1998) 'Some Questions on the Differential Success of Portuguese Students' Mimeo, CEPCEP, Catholic University of Portugal, Lisbon [16]

McIntosh S (1998b) "The Demand for Post-Compulsory Education in Four European Countries" Centre for Economic Performance Discussion Paper No. 393, May [17]

McIntosh S (1998a) "Job quality in the United Kingdom, 1985-1995' Working Paper No. 981, Centre for Economic Performance, London School of Economics and Political Science [18]

McIntosh S (1999) 'A Cross-Country Comparison of the Determinants of Vocational Training' Centre for Economic Performance Discussion Paper No. 432, July [19]

Mellander (1999) 'The Multi-Dimensional Demand for Labour and Skill-Biased Technical Change' Mimeo, Industriens Utredningsinstitut, Stockholm [20]

Murray A and Steedman H (1999) "Growing Skills in Europe: the Changing Skill Profiles of France, Germany, the Netherlands, Portugal, Sweden and the UK" Centre for Economic Performance Discussion Paper No. 399, (Revised December 1999) [21]

Murray A (1997) 'Young People without an Upper Secondary Education in Sweden. Their home background, school and labour market experiences' *Scandinavian Journal of Educational Research*, Vol. 41, No. 2, [22]

Murray A (1999) 'Low-skilled Young People on the Labour Market in Sweden from the 1970s to the 1990s mimeo Stockholm Institute of Education; accepted for publication as 'Changes on the Labour Market for Young Adults without Further Education and Training' in the *Journal of Education and Work* (forthcoming) [23]

Steedman H (1999) "Looking into the Qualifications Black Box: What can International Surveys tell us about Basic Competence?" Discussion Paper No. 431 Centre for Economic Performance, London School of Economics and Political Science [24]

Steedman H (1999) 'Low Skills: How the Supply is Changing across Europe' in European Trends in Occupations and Qualifications, CEDEFOP, Luxembourg [25]

Houtkoop W (1999b) 'Progress towards a minimum learning platform in Europe' Max Goote Centre, University of Amsterdam, mimeo [26]

2. BACKGROUND AND OBJECTIVES OF THE PROJECT

The focus of research

The decision to focus the research on the low-skilled was spurred by the fact that by the beginning of the 1990s in Europe it was becoming clear that an unprecedented change had overtaken the low-skilled on the labour market. Compared to the position at the beginning of the 1970s, the gap between the earnings of the low-skilled and the higher-skilled had widened in a majority of EU countries and in Canada and the US. This trend resulted from large real wage gains at the top of the earnings scale and stagnant real wages at the lower end of the distribution (Machin 1998). In the United States where the labour market is more deregulated than in Europe and welfare less generous, the low-skilled group experienced a *fall* in real wages In all of the EU countries included in the *NEWSKILLS* analysis except for Germany, earnings differentials widened over the period 1980-1995. In France, the Netherlands and Sweden the change was only slight, but in the UK and in Portugal the change was relatively large.[4]

In all industrialised countries from the late 1970s onwards the low-skilled were increasingly likely to experience spells of unemployment - in particular long-term unemployment (OECD1994). In the flexible US economy this falling demand was reflected in falling real wages. In the more regulated European economies the wages of the low-skilled were kept artificially high at a price which meant that demand for the low-skilled fell (OECD op.cit.).

The conclusion of economists studying the question was that the causes of the deterioration were structural and were therefore unlikely to be removed simply as a result of improvements in economic growth resulting from the normal fluctuations of the business cycle (see Chapter 2 for an overview of recent literature).

A policy-oriented, problem-solving approach to research

The NEWSKILLS research project started, therefore, from a concern to bring academically rigorous research techniques to bear on a pressing social, educational and economic problem - namely the changing situation of the low-skilled on the labour market. The first aim was to understand better the change in the proportions of low-skilled on the labour market over the period 1985-1995. The second aim was to investigate the extent to which employers' demand for the low-skilled was falling and why. The third aim was to investigate factors affecting the supply of skills, in particular low-skilled adults in the workforce. Finally, the aim was that findings from research studies should be 'put to the test' in a forum of policy makers, employer and employee representatives, and in a series of case studies of firms employing low-skilled labour. The outcomes of all these activities should be proposals and conclusions of interest to policy makers.

---

[4] Change in the differential is measured as change in the ratio of the average earnings of those in the 90th earnings percentile:average earnings of those in the 10th earnings percentile. Data taken from OECD *Employment Outlook* 1996.

The need for an inter-disciplinary approach

The challenge of the deteriorating labour-market conditions of the low-skilled calls for the expertise of an inter-disciplinary team of economists and education specialists. Economists have expertise in the building of models of the functioning of labour markets so as to provide an understanding of changes taking place and factors influencing change. Education specialists can provide an analysis of the changing production of education systems over time and of factors influencing their evolution. The *NEWSKILLS* project recruited at least one economist and one education specialist from each EU country participating in the project.

The choice of participating countries

Participating EU countries were France, the Netherlands, Portugal, Sweden, and the UK. German data was collected where feasible. It is not by chance that the main impetus for the research initiative came from the UK. The UK government has long been concerned by the large proportion of individuals in the working age population with no or low skills compared to other European countries. Consequently, there has long been interest in the UK in the apparently more effective performance of the Swedish economy in reducing numbers with low skills and maintaining high levels of labour force participation. The Netherlands has also excited strong research interest because of high productivity and a widespread and effective system of technical education. France is of comparable size to the UK and has a low-skill group of similar proportions to the UK in the working population. However, growth of well-qualified young people is reducing the low-skilled group more rapidly than in the UK. Portugal was selected as representative of newer EU countries at a different stage of economic and educational development. As mentioned above, German data was also included in the analysis where feasible.

The challenge of the inter-disciplinary approach

While collaboration between researchers from different EU countries occurs fairly frequently, two features of the *NEWSKILLS* project made the project somewhat unusual and innovative. First the collaboration was cross-country and inter-disciplinary, second, the research was problem-oriented. These two aspects of the work had the following implications. First, the very different academic traditions of economics and education required all those involved to acquire understanding of the terminology and key concepts of researchers from outside their own discipline. Secondly, the problem-centred approach to research required that research projects be formulated with regard to *questions that needed to be answered* and not, as is often the case, with regard only to the availability of data.

Method of working

The research group had been brought together by a common interest in studying the labour market situation of the low-skilled and all participants had already produced distinguished work in this area. The work programme agreed with the administrators of the TSER 4th Framework Programme at the European Commission (DGXII) outlined the main themes and methods of study and set firm dates for delivery of the programme. At the same time the work programme left sufficient flexibility to allow all participants to work to their strengths, building on existing research, applying tried and tested techniques to new problems and expanding recent analysis.

Subsidiarity - developing the research programme

It was at the group's first full meeting in April 1996 that the detailed programme of research for the *NEWSKILLS* project was drawn up. Information on data availability was shared and decisions taken about the time period that it would be feasible to study for all countries. Each member outlined the way in which he/she considered he/she could most fruitfully contribute to the work programme. Responsibility for the four Projects outlined in the work programme was assumed as follows:

Project 1 Changing labour-market demand for the low-skilled 1985-1997 and factors affecting demand
Centre de Recherche et d'Etudes sur les Qualifications (CEREQ), Marseille
Research Institute of Industrial Economics (IUI), Stockholm
Faculty of Economics, University of Amsterdam
London School of Economics (LSE), University of London

The work carried out for Project 1 by CEREQ ('Devenir des bas niveaux de qualification: comparaison des situations nationales')[8] built upon an earlier published study of France only and used a similar methodology. The aim was, simply, to chart for each country the changing labour-market situation of the low-skills group over the period 1985-1997. The method involved showing, for each qualification group the labour market situation (using three categories, employment, unemployment and inactivity) while controlling for the relative size of each qualification group. This gives an indicator over time of whether the low skill group has a higher propensity to e.g. unemployment than the average for the population as a whole. The advantage of this analysis is that it makes it possible to chart change in the labour market situation of the low-skilled over time while controlling for the change in supply. Furthermore, the analysis could be carried out for different sub-groups, the young, men and women and for different sectors. This final point was important since the project planned by the Industrial Institute was restricted to manufacturing as a result of non-availability of data for the service sector. The CEREQ analysis, it was hoped, would show the trend in employment of the low-skilled in various key sectors (including the expanding service sectors) and form a sound basis for predictions concerning the future of that group on the labour market.

The study of demand for the low-skilled carried out by the Stockholm IUI ('The Multi-Dimensional Demand for Labour and Skill-Biased Technical Change')[20] constructed an econometric model which allowed demand functions for workers with different levels of education to be derived from a representation of the firm's technology based on neo-classical production theory. Data on employment and other production data are then used to estimate the parameters of these demand functions. Technical changes are allowed to have different impacts on the different categories of labour *ceteris paribus*, thus capturing the feature that technological developments may increase the demand for workers at some educational levels while reducing the need for workers with other qualification levels.

From these two studies it was hoped to construct an accurate picture of how the low-skilled had fared on the labour market over the past ten or so years and make some predictions about future trends. Second, it was hoped to test further the hypothesis that technological change was the most important explanatory factor behind the worsening labour market situation of the low-skilled.

Researchers at the University of Amsterdam examined the relationship between earnings and skill level for a number of European countries and the US to obtain evidence on the labour market position of these groups in different countries ('Explaining International Differences in Male Wage Inequality by Differences in Demand and Supply of Skill') [11]. The work carried out by the University of Amsterdam and the LSE ('The Quality of New Jobs for the Low-Skilled in Europe'[12] and 'Job Quality in the United Kingdom, 1985-1995') [18] examined, where possible, changes in the quality of 'new' jobs. It was planned that this analysis would show whether changes in the quality of 'new' jobs are affecting particular skill groups, or whether jobs are changing generally for all workers. In the process, the analysis provided additional evidence as to the relationship between increasing job complexity and the position of the low-skilled. It also produced an analysis of changing wage differentials by education group comparing new 'hires' with those already in jobs.

Project 2 Factors affecting the supply of skills
Faculty of Economics, University of Amsterdam
London School of Economics, University of London

We already knew that considerable changes were taking place in proportions of the younger populations gaining qualifications. The main aim of studies carried out for Project 2 was to understand better factors which had led to these changes in qualification levels. Factors influencing young people to stay on after the end of compulsory schooling were examined using time-series analysis ('The Demand for Post-Compulsory Education in Four European Countries') [17]. The training of adults in the workplace was analysed in three further studies ('Demand and supply of work-related training: Evidence from four countries'[10], 'A Cross-Country Comparison of the Determinants of Vocational Training'[19] and 'Evaluating Firm Training; Effects on Performance and Labour Demand') [6].

Project 3 The measurement of low skills - issues of changing levels and measurement issues
CEP, Catholic University of Lisbon
Stockholm Institute of Education
London School of Economics, University of London

This part of the programme had a number of aims. First the education specialists saw themselves in a 'support' role, testing and advising the economists on a definition of low skills which could be used across all the countries concerned. This was essentially the work carried out at the LSE ('Looking into the Qualifications Black Box: What can International Surveys tell us about Basic Competence?')[24] which discussed and tested the ISCED classifications for consistency of standards across countries.

A second aim was to chart accurately the change in the supply of skills (using qualifications as a proxy) across the EU countries concerned over the ten/twelve year period investigated. This work was carried out by researchers from the LSE and the Stockholm Institute of Education using Labour Force Survey data supplied by members of the group ('Growing Skills in Europe: the Changing Skill Profiles of France, Germany, the Netherlands, Portugal, Sweden and the UK') [21].

A third aim which could only be partially realised was to chart flows and labour market destinations of young people in the low skills group over time. Sweden was the only country for which adequate and reliable longitudinal data was available to carry out this work and two projects were undertaken by the Stockholm Institute of Education ('Young People without an Upper Secondary Education in Sweden. Their home background, school and labour market experiences' [22] and 'Changes on the Labour Market for Young Adults without Further Education and Training') [23].

Finally, the work to chart inputs of education systems from TIMSS data was undertaken by the Catholic University of Portugal. This work is still in progress.

Project 4 The definition of a minimum learning platform
Max Goote Centre, University of Amsterdam

As explained above, this part of the programme involved face to face discussion and enquiry with the social partners and firms and a review of government policies in the field. It was hoped that CEDEFOP would agree to host a seminar attended by representatives of the social partners at which the findings of the first two years of the *NEWSKILLS* work could be discussed and the work of the final year could be planned. A common questionnaire would be formulated and in each country four visits would be undertaken to large employers of low-skilled labour. The Max Goote Centre would again be responsible for an analysis of the visit findings and the results would form the basis of a separate paper. In all these discussions there would be an opportunity for testing the findings of the Projects 1, 2 and 3.

Data problems

The detailed work programmes were drawn up with regard to the data that were known or believed to be available in each country. For each project the responsible researchers aimed to study the problem chosen with respect to all the countries included in *NEWSKILLS* and Germany, where feasible. Since one of the main aims of the project was to study the period beginning 1985, few longitudinal datasets at the European level were available for all our countries and none that were suitable for our purposes. The project had thus to build its own datasets. This meant that for many studies researchers were heavily dependent upon the rest of the group for the supply of data from national sources.

Different strategies for overcoming the data problems

A number of the studies carried out within the *NEWSKILLS* programme were very much dependent on the work of the rest of the group members since the majority of studies depended on data supplied by other members of the group. The strategy of relying on other group members worked well for a number of studies. However, in the case of one project, the data series specified in the model proved to be unavailable for most of the countries. Only data for one country was finally used in the study. A second strategy adopted partly as a result of the realisation of the difficulties created by too tight a specification of the model to be tested was to specify a type of analysis [New Jobs Study] to be carried out by group members in each country using data available, the results to be compared where feasible. This approach yielded a study of thee countries (analysis of a fourth, Sweden, is still ongoing) from which certain generalisations were arrived at, however, because of the looser specification of the original approach and different data sources used, conclusions could not always be generalised across all countries. A third strategy adopted from the outset for cross-sectional analysis was to use existing international datasets containing individual-level data on the labour market and skills, the Third Mathematics and Science Study (TIMSS) and the International Adult Literacy Survey (IALS). This approach yielded some useful conclusions, limited only by the fact that IALS data was not available for two of the countries in our group (France and Portugal).

The timing and sequencing of the work

From the outset it was planned that the academic studies carried out by the group should be completed two years after the start of the project and this aim was largely achieved. At that point, and as already mentioned in 1. 7 above, it was planned that the results of the academic studies should be 'put to the test' in a forum of policy makers, employer and employee representatives. This forum was hosted by the Centre for the Development of Vocational Training (CEDEFOP) in Thessaloniki on 29-30 October 1998 and the proceedings of that meeting form the subject of a separate publication entitled **Agora - IV** *The low-skilled on the European labour market: prospects and policy options* [1].

During the final year of the project group members worked on a common programme which consisted of an investigation into the progress towards the definition of a common learning platform in their own countries (Project 4). In addition, a series of case study visits to firms were carried out, using a common questionnaire in each. Findings from these visits are summarised in a paper prepared by the Max Goote Centre ' The position of the low-skilled in firms' (Houtkoop 1999). Annexes to this paper contain the common questionnaire used for the site visits and more detailed descriptions of the firms visited. The firms were chosen because they employed a large proportion of low-skilled labour. The results of the investigation into progress towards a common learning platform for individual countries are also included in the list of NEWSKILLS papers (Houtkoop 1999b).

3. SCIENTIFIC DESCRIPTION OF THE PROJECT RESULTS AND METHODOLOGY

Review of the most relevant literature

(i) The Value of Skills

The literature examining the importance of skills held by individuals considers the relationship between skills and outcomes, at the national and at the individual level.

At the national level, for example, Bishop (1989) shows how the decline in US students' scores on standardised aptitude tests (1967-1980) has reduced labour productivity and GNP, the latter by as much as 86 billion dollars by 1989. Such studies have typically not, however, indicated which particular skills are most productive. The few studies that have attempted to evaluate the effect of specific skills, for example, basic literacy, on economic growth, have generally found statistically insignificant results (eg, Doyle and Weale, 1994).

At the individual level, the link between skills and earnings is also evidence of the importance and productive relevance of skills. Skills in these studies are typically measured by standardised tests of numeracy and literacy. Numerous studies have found positive returns to mathematical ability (Kenny *et al*, 1979, Willis and Rosen, 1979, Grogger and Eide, 1995, Murnane *et al*, 1995, and Dolton and Vignoles, 1997). Murnane *et al* (1995) suggest that mathematical skills became a more important determinant of wages in the 1980s, compared to the 1970s, and that much of the increase in the college-high school wage premium in the 1980s can be attributed to this increase in the importance of basic mathematical skills. Similarly, Rivera-Batiz (1992) demonstrates the importance of quantitative literacy for employment probabilities.

Note, however, that when skills are disaggregated, not all are revealed to have a positive effect on earnings. For example, Green (1998) finds that computer skills earn the highest wage premia, while problem-solving and verbal skills also have statistically significant effects. However other basic skills, for example numeracy, seem to earn no returns. Similarly in the US, Bishop (1990) finds that, for men, technical achievement and speed of mathematical computations have a positive effect on earnings, but this is not found for academic achievement test scores. Bishop argues that these results show that the US labour market does not value very highly many of the academic skills that students in high schools are urged to develop. This is despite the fact that high scores on such tests are shown to be positively correlated with job performance and performance in training programmes. This seems to imply that a different reward structure, rather than a different curriculum may be the best reform.

(ii) Wage Inequality and the Demand for Skills

The body of research that has examined changes in wage inequality is of relevance, because it provides evidence of changing demand for skills. Changes in the supply of skills offered on the labour market can be proxied by changes in the qualifications held by individuals. It is a relatively easy task to find the data in a range of official publications that show a rising trend in the qualifications held by the populations of almost all countries, and a corresponding decline in the proportions of individuals holding no or low level qualifications. Thus the supply of skills to the labour market is increasing. Given this fact, and if there were no other changes, we would expect to observe falling wage inequality, as the well-educated become more plentiful, and so receive a fall in their wages, relative to the less well-educated. This is not the case, however, indeed the reverse has occurred in the US and the UK, and wage inequality has risen dramatically. This increase is well-documented, for example in Bluestone and Harrison (1988), Katz and Murphy (1992), Levy and Murnane (1992) and Murphy and Welch (1992) for the US, as well as the special issues of the *Journal of Economic Perspectives* in 1995 and 1997, and in Gregg and Machin (1993), Gosling *et al* (1994) and Schmitt (1995) for the UK. Thus, it seems reasonable to conclude, as do for example Manacorda and Manning (1999), that the demand for skills must have kept pace, and indeed exceeded the growth in the supply of skills.

Juhn (1999) considers wage inequality across five decades in the US, from 1940-1990, and comes to the same conclusion, that changes in wage inequality are driven by changes in the supply of and demand for skills. In particular, he argues that the fall in inequality in the 1940s was due to the rapid rise in the supply of skills (as measured by educational attainment), while the subsequent rise in inequality in the 1980s was due to accelerated demand for skills (as measured by industry and occupation shifts).

What can have caused this rise in the relative demand for skills? Two theories are most frequently advanced. One is that skill-biased technological change has increased the demand for skilled workers (for example, see Berman *et al*, 1994), while an alternative explanation is that increased trade from developing countries that specialise in typically low-skilled manufactured goods, reduces the price of such goods, and hence the demand for and wages of low-skilled workers in developed countries (for example, see Wood, 1994).

A number of papers have attempted to distinguish between these two theories and say which has caused the fall in demand for unskilled workers and the rise in wage inequality. One method that has been frequently used in the literature is to decompose the change in wage inequality into its within-industry and between-industry components. The argument is that the within-industry component is associated with the skill-biased technological change theory, as industries upgrade their workforces, while the between-industries component is associated with the trade theory, as developed countries move out of the low-skilled industries in which they cannot compete with the developing countries, and into the more hi-tech, skilled industries. Machin (1996) amongst others, performs this decomposition, and finds that most of increase in wage inequality has occurred within industries, suggesting that skill-biased technological change is the main reason for the increase.

Such tests are informative, but not conclusive, and further examinations have been undertaken in this area. For example, Machin (1996) finds that in the UK, a variable measuring R&D expenditure at the industry level has a statistically significant positive effect on industries' non-manual wage bill and employment shares, and similarly for counts of innovations. At the establishment level, he shows that an increase in computer usage leads to increasing employment of non-manual employees, particularly senior professionals, and declining employment of manuals, particularly unskilled manuals. Machin and Van Reenen (1998) obtain similar results in each of the seven countries that they analyse, in terms of the effects of R&D expenditure and computer usage on the increase in demand for skilled labour. They also include a measure of import penetration in their estimated equations, but in no case does it attract a correctly signed coefficient that is statistically significant. Indeed, often they find that the industries that have witnessed the greatest rise in foreign competition are also reducing their numbers of skilled workers, contrary to the idea of the international trade argument that they should be responding by concentrating more on skilled production or services.

Autor *et al* (1998) focus specifically on computers, as the cause of the rise in the demand for skilled labour. They point out that, in the US in the 1980s, the shift towards more educated workers, or workers in professional occupations, occurred in industries that have had the greatest increase in computer usage. In regression equations explaining the industry-level change in the employment share of educated workers, they find that the coefficient on a variable measuring computer usage is positive and statistically significant, even when controls for changes in the overall capital intensity and the growth in industry shipments are added. Overall, Autor *et al* estimate that the rise in computer usage can 'explain' about one-third of the increase in the within-industry skill upgrading in US manufacturing from the 1970s to the 1980s.

Berman *et al* (1998) argue that for skill-biased technological change to have led to an increasing share of skilled workers in employment and a higher relative wage, it must have been pervasive across all countries, so that countries as a whole can behave as a single closed economy, to obtain the necessary price and wage effects for the above results. The authors therefore calculate cross-country correlations of the industry-level changes in the proportion of non-production workers in the 1980s. Nearly all of the correlation coefficients are positive, and 11 out of 36 are statistically significant at the 5% level. They show that the key industries driving this result, by having large increases in the proportion of non-production workers in each country, are machinery (and computers), electrical engineering, printing and publishing and transportation. Case studies suggest significant skill-biased technological change in these industries, and in fact, it is these industries that had the highest rates of investment in the US in the 1980s (after the defence and space industries). As final proof of the pervasivness of skill-biased technological change, the authors obtain similar results when they also consider less developed countries.

Haskel (1999) constructs a panel data set of 80 3-digit industries in the UK, from 1980-1989, and maps in a lot of information from different sources, to evaluate the principal causes of rising wage inequality. The most important explanatory variable is the change in the use of computer technology. Wage inequality increased by 13% over the 1980s, and according to the regression equation, increased use of computers can explain over half of this increase. The remainder is explained by declining levels of unionisation, increased levels of contracting out, higher numbers of small firms, and higher numbers of non-manual workers. The effect of the change in the relative import price has the correct (negative) sign, but is statistically insignificant.

Most evidence therefore points towards skill-biased technological change, and in particular computer usage, as the cause of the decline in the demand for low-skilled workers. However, certain criticisms have been levelled against the results that indicate the all-importance of computer usage. First, in wage equations, there is the possibility of unobserved heterogeneity. Krueger (1993), for example, offers seemingly convincing evidence that workers who use computers in their job earn 15-20% more than otherwise similar workers, with the implication being that computers improve their productivity and hence wages. DiNardo and Pischke (1997), however, show that workers who use telephones, calculators or even pencils also earn a significant wage return. Given that (virtually) all workers have the necessary skills to use such instruments, these results suggest that the instruments are not increasing productivity *per se*, but that jobs which involve the use of such instruments (ie office jobs) are more likely to attract skilled or productive workers. Similarly, Oosterbeek (1997) suggests that if computer use increases workers' productivity, then increasing intensity of computer usage should lead to higher levels of productivity, and hence higher wages. However, his estimated wage equations reveal that, in the Netherlands, there is no significant difference in the wages of individuals who use computers daily, monthly, or almost never; they all earn a positive wage differential over workers who never use computers. Oosterbeek therefore also concludes that the positive effect of computer use on earnings is due to unobserved heterogeneity, with more able workers being more likely to use computers. A second problem with the computer literature is that computer use rarely seems to increase productivity, when actual productivity data can be obtained. For example Morrison (1997) quotes Robert Solow as saying 'We see computers everywhere except in the productivity statistics.' She goes on to analyse the reasons for this, and concludes that firms overinvested in IT during the 1980s, possibly because of short-term learning or adjustment difficulties, or overestimation of the expected cost reductions obtainable from such investment, thus reducing marginal products of computer equipment. Only towards the end of the 1980s does she find evidence of rising marginal products, particularly in nondurable industries.

Finally, there is the problem of the extent to which it is straightforward to talk about the 'effect' of computer use on labour demand. This is because computers are factors of production, just like labour, and hence the demand for both should be derived according to profit maximisation criteria. This is rarely undertaken in the studies outlined above, however, the vast majority of which simply include computer use as an assumed exogenous right-hand side variable in their estimated equations. Thus while computer use has certainly proliferated over the last 20 years or so, and this seems to be going hand in hand with higher wages, more employment of skilled workers, greater wage inequality, the exact causal relationships between these variables should be treated with care.

Focussing more on trade effects on labour demand, Haskel (1999) points out that even though the direct Stopler-Samuelson type effects of trade on wages seem to be small, there may still be indirect effects, with increased trade causing firms to introduce new technology. Indeed, when he replaces computer use, small firms and contracting-out with the level and change in the relative import price in his regression equation, both have the expected negative effect on wage inequality, with the level effect being statistically significant. Thus the indirect effects of trade may be important.

Similarly, Borjas and Ramey (1995) consider the trade argument. They argue that low-skilled workers in uncompetitive sectors receive a share of the rents generated in such markets and earn high wages, so that import penetration into such markets in particular should raise wage inequality, through falling rents and hence wages in those sectors, and displacement of low-skilled workers to competitive, low-paying industries. The evidence reveals that the reduction in employment in trade-impacted concentrated industries can explain 23% of the reduction in the relative wage of low-skilled workers over 1976-1990, while changes in trade explain about half of this fall in employment. Thus the authors conclude that trade effects can explain about 10% of the increase in wage inequality over this period, and thus other factors, such as skill-biased technological change must be important. In a review of the evidence, the OECD *Employment Outlook* (1997) comes to a similar conclusion, while acknowledging the possible indirect effects of trade mentioned above.

A related literature has noted that wage inequality has not risen as much in many countries as it has in the UK and US, and asks why this is, if skill-biased technological change has been pervasive across the developed world. For example, Snower (1996) notes only a modest increase in inequality in Austria, Australia, Belgium, Canada, France, Japan, the Netherlands, Portugal, Spain and Sweden, while inequality has remained roughly constant in Denmark, Finland, Italy and Norway, and has fallen in Germany. He attributes this to the low-skill bad-job trap. In countries that have a low proportion of skilled workers, there is no incentive for firms to offer high-skilled jobs, as they will not find the workers to fill them. But if high-skilled jobs are not being created, there is little incentive for individuals to acquire skills. Thus there remains a high proportion of low-skilled workers, completing the vicious circle. Countries with a high proportion of low-skilled individuals and jobs therefore remain that way, with corresponding high levels of wage inequality between such workers and the lucky ones with good jobs, while in countries with high proportions of skilled workers, there are many more good jobs opened, paying good wages and thus reducing wage inequality. Nickell and Bell (1996) propose similar arguments to explain why inequality has not increased in Germany, despite German unskilled unemployment being below the level observed in the UK, and similar to the level in the US. They point to the high levels of ability achieved by the large group with middle level qualifications in Germany, as measured by standardised test scores, and argue that the availability of such a large skilled workforce allows Germany to respond in a flexible manner to demand shifts. The situation therefore does not develop whereby a large proportion of the workforce are unable to cope with the demands placed upon them by technological change. The high productivity achieved by the middle-skilled people can therefore carry along the few who remain low-skilled, who thus earn more than their counterparts in comparative organisations in the UK and the US. This argument suggests that schooling and training are important for raising the standards of the workforce, to mitigate the consequences of the shift in demand away from the low-skilled. Snower (1996) also suggests that subsidies to firms for opening high-skill jobs would help to avoid the low-skill bad-job trap.

Such arguments are formalised in the models developed by Acemoglu (1997, 1998). With endogenous technological choice, firms may not adopt high-skill technology even when available, if they do not believe that suitable workers will fill the jobs created. If only low-skilled workers are available, firms will adopt the appropriate technology. Thus, it need not be the case that technological change is skill-biased; history is littered with examples of new technologies making jobs easier to perform with a lower level of skills. An expansion of the skill base can therefore increase the adoption of high skill technologies, thus eventually raising job standards for all.

Similarly, Lloyd-Ellis (1999) develops a model with endogenous adoption of technologies. He argues that if there is a scarcity of skilled workers, competition for those that do exist will drive up their wages, leading to increased wage inequality. But the higher wages of skilled workers will persuade firms not to adopt technologies that require such workers. Thus, it is suggested that the slowdown in labour productivity growth and the contemporaneous rise in wage inequality that occurred in the US in the 1970s and the 1980s are due to the slowdown in the growth of skills. Lloyd-Ellis highlights new teaching methods that have reduced the acquisition of basic mathematical, scientific and technical skills as a possible cause of the slowdown in the growth of appropriate skills. The solution is clearly greater skill acquisition amongst the population.

Saint-Paul (1996) adds a cautionary note to such conclusions derived from these models. He argues that as the proportion of skilled workers in the economy rises, the low-skilled become less and less employable, in the presence of firing costs. For example, a firm must decide whether to hold a vacancy open for a skilled worker, or hire an unskilled worker, who will be costly to dismiss. As the proportion of skilled workers rises, the likelihood of the firm filling a vacancy with a skilled worker rises, and so they are less likely to employ a low-skilled worker. Beyond a critical proportion of the population being skilled, no low-skilled workers will be employed at all. Saint-Paul therefore extols the virtues of general education to raise the productivity of the whole of the unskilled workforce, rather than vocational training to raise the productivity of a few, to the detriment of the remainder.

Crouch (1997) also adopts a cautionary approach to upgrading skill levels through vocational training. He identifies a number of problems. First, the processes outlined above may take time, and while firms are only slowly realising that the quality of workers is improving, and so only slowly opening more good jobs, workers who have upgraded their skills will become disillusioned with their lack of opportunities. Second, continued productivity gains reduce the number of individuals needed to produce a unit of output, and so can lead to employment falls[5]. Third, few export-led industries are high skill, and so raising skills will not particularly help a country's competitive position[6]. Finally, hoping private agents such as firms will realise the collective goal of a more skilled population may be misguided, as they lack the appropriate incentives, due to the classic public good problem. Crouch points to apprenticeship systems, such as that in Germany, which links firms and state education systems in a partnership for the initial training of young people, preserves the collective good component, and makes training sensitive to the needs of individual firms. However, problems have emerged even in this system, for example the number of vested interests can make adaption to change slow. Crouch concludes that it is 'difficult to see any major democratic alternative to a prolonged and intensified commitment by governments to publicly funded education at most levels as part of the learning society strategy' (p. 381)[7].

(iii) Which Skills are Being Demanded?

The wage inequality literature suggests that there has been an increase in the demand for skilled labour since 1980, and further, that this seems to have been linked, in particular, to skill-biased technological change. Further investigation by these studies has also led to the finding that the use of computers, in particular, is an important cause of the rise in the demand for skills. Other studies have looked more closely at the skills now being demanded in the labour market.

The 1997 Skills Survey in the UK is useful in this respect (see Ashton *et al*, 1999, and Green *et al*, 1998). Since similar questions are asked in this survey and in the 1986 Social Change and Economic Life Initiative (SCELI) survey, an analysis of changes over time is possible. The authors first show that skill demands have indeed risen between 1986 and 1997. First, there is an increase in the proportion of jobs requiring some qualifications, from 62% to 69%, while for high level qualifications (above 'A' level) the increase is from 20% to 24%. There is a fall from 66% to 57% in the proportion of workers whose job requires less than 3 months of training, and an increase from 22% to 29% in the proportion of jobs with long (more than two years) training requirements. 27% of respondents in 1986 said that they could master their jobs within a month, while the equivalent percentage in 1997 was 21%. Finally, the proportion of respondents 'using' a degree in their jobs, in the sense that they have a degree and it is considered 'essential' or 'fairly necessary' for their job, has risen from 7.7% to 10.8%. All the evidence therefore points in the same direction, that there has been an increase in the demand for skills.

---

[5] Note that work undertaken as part of the NEWSKILLS project suggests that this argument is not necessarily correct (Kazamaki Ottersten *et al* 1999). This paper shows that if there is capital-skill complementarity and capital is fixed in the short run then it is possible that there is a negative short run effect on labour demand, due to the mechanism described by Crouch. However, in the long run when the capital stock adjusts to its new optimal level there is instead a positive effect on labour demand and this effect might outweigh the initial, negative, effect. The paper's empirical analysis shows that this is not merely a theoretical possibility; it actually happens in the data set studied.

[6] Again, this argument seems too simplistic in the sense that it is based on a completely static view; raising skills might lead to increased competitiveness and increased exports in the future.

[7] While the importance of general education is certainly true, high rates of return to vocational training have been obtained in the literature, which suggest that training has a role to play as well. For example Blundell *et al* (1995) found such high returns, particularly to employer-provided off-the-job training.

Ashton *et al* (1999) show that there has been an increasing use of computers between 1986 and 1997, and at higher level of complexity. Computers are therefore again identified as one of the prime sources of the increase in demand for skilled labour. In addition, other skills to which a greater importance is now attached include communication skills, social skills and problem-solving skills. Wage data show that these skills are now highly valued in the labour market, particularly computer skills, which pay a premium of 21% for males and 22% for females, even when used to only a moderate level of complexity. This evidence is therefore consistent with the assertion in the wage inequality literature that IT has been responsible for some of the increased dispersion in earnings. Further, Green *et al* (1998) show that computerisation has increased fastest outside of manufacturing, casting doubt on the theory that trade competition in manufacturers from less well-developed countries is driving the change in the demand for skills. Finally, the authors note that the increase in skills has been greatest where R&D intensity has been highest, and also in 'modern' workplaces, that is those that have adopted the use of quality circles, appraisal schemes, meetings, suggestion schemes etc.

Caroli and Van Reenen (1999) also consider the relationship between the changing nature of work and the rise in the demand for skills. They show that organisational change leads to a significant reduction in the wage bill share of the least skilled group of workers, unskilled manuals, and an expansion of the middle layers of the occupational hierarchy, in both Britain and France. Further, and specifically, the introduction of computers is shown to have similar effects on the wage bill shares of these occupation groups in Britain, although no statistically significant results could be obtained for France, mainly because of the paucity of the computerisation variable. Further experiments, allowing for the endogeneity of organisational change, reveal that such change falls when wage inequality is high, that is when there is a relative shortage of educated workers (thus consistent with the ideas of Acemoglu, 1997 and 1998, Lloyd-Ellis, 1999, and Snower, 1996, above). Finally, the hypothesis that organisational change and skills are complementary receives support with French data, through a 'growth in value added' equation. The coefficient on an interaction term between organisational change and skills is negative and statistically significant, suggesting that less skill-intensive plants are less likely to benefit from organisational change.

Gallie (1991) uses SCELI data for the UK to show that, of those respondents using automated or computer equipment, 73% report that they need at least 'O' levels to get their job, while of those not using such equipment only 37% report that 'O' levels are a requirement. Similarly, Simpson *et al* (1987) argue that, although an unskilled worker can in principle operate computer numerically controlled equipment, firms are more likely to demand skilled workers, for their ability to judge quality and identify faults. Finally, Haskel (1996) summarises a range of case study evidence that suggests that microprocessors increase the demand for skilled labour. Computers therefore seem to be the driving force behind the increase in the skill demand, with computer literacy and numeracy, amongst other skills including communication and problem-solving, being the skills in demand.

(iv) Overeducation

Another literature that has developed concerning skills, and which does not sit easily with the previous analysis on the rising demand for skilled labour, is the work on overeducation. Overeducation exists when workers possess higher level qualifications then they need to actually do their jobs. That it is a significant phenomenon is illustrated by the results of Dolton and Vignoles (forthcoming), which show that 30% of a random sample of 1980 graduates did not need a degree to get their jobs. Comparing this figure to that derived from similar 1970s data reveals that the incidence of overeducation seems to be rising. Hartog (1997) undertakes a major survey of the literature, covering studies from a whole range of countries, and comes to the same conclusion, that the incidence of overeducation is rising over time. Note that these studies also allow for the existence of undereducation, whereby individuals have a lower level of education than is typically required in their jobs. The evidence suggests that undereducation occurs less frequently than overeducation, and that the incidence seems to be falling over time.

Most work in this area goes on to analyse the effects of over- and under-education, by estimating wage equations that include indicators of such employment positions. Again, Hartog (1997) provides a wide-ranging summary of these studies. The results are very consistent across studies, and suggest that the return to surplus education, while postive, is significantly less than the return to required education.

The reason why this literature does not sit easily with the previous research outlined above is that if there has been a significant rise in the demand for skilled labour, why do those workers who are overeducated not fill this demand, rather than work in jobs for which they are overeducated? Green *et al* (1999) analyse this question, and find some evidence to suggest that the overeducated have a lower level of ability than those with the appropriate level of education for their jobs, as measured by standardised tests. In addition, there is some limited evidence that the overeducated do not possess the appropriate skills that are being demanded by the labour market. In particular, it seems that while such individuals may have a high level qualification, they lack the necessary numeracy skills to be effective on the labour market.

(v) Vocational Training

A final literature to be considered here has concerned itself with vocational training, in particular analysing the characteristics of individuals and jobs that are associated with the receipt of workplace vocational training. A large number of studies have analysed such questions, and cannot be summarised individually here (see Altonji and Spletzer, 1991 Arulampalam and Booth, 1997, Blundell *et al*, 1995, Booth, 1991, 1993, Booth and Satchell, 1994, Green, 1993a, 1993b, Greenhalgh, 1999, Greenhalgh and Mavrotas, 1994, Greenhalgh and Stewart, 1987, Heyes, 1993, Kennedy *et al*, 1994, Knight and Latreille, 1996, Lillard and Tan, 1992, Lowenstein and Spletzer, 1997, Lynch, 1992, and Tan *et al*, 1992). At their most basic, these studies simply run a probit equation, with the dependent variable being a yes/no dummy indicating the receipt or otherwise of vocational training. Certain results are found consistently across studies. For example, the vast majority of studies have found that males, the well-educated, the young, individuals working in senior occupations, in large firms or in unionised establishments, are all more likely to receive workplace vocational training. The literature has developed from these basic studies in a number of ways, for example by separating out training into different components such as on-the-job and off-the-job, by considering the amount of time spent training, and not just the incidence, and by analysing merged firm-worker datasets, that can increase the number of explanatory variables that can be included in the estimated equations. Typically, however, these modifications do not have a large effect on the results and the general results outlined above continue to hold, despite a few variations, for example that although the less well-educated are less likely to receive training, once they do receive it, they seem to receive as much as the well-educated.

Summary of the research findings generated by the *NEWSKILLS* programme

This section sets out the findings and results from Projects 1, 2 and 3 of the *NEWSKILLS* research programme . Originally we had placed the investigation of demand as the first stage in our programme. However, in our most recent discussion of the results of the project and the presentation of our Final Report it was suggested and agreed that a more logical ordering was to consider first the evidence collected on changes in supply and the reasons for change (Projects 3 and 2 respectively) while Project 1 on demand would be presented last. That is the ordering followed here.

Defining and measuring the low-skill group

It was envisaged at the outset of the *NEWSKILLS* project that the econometric and statistical analysis of labour market demand for and supply of individuals at low skill levels would use data drawn from national government surveys and international surveys such as the International Adult Literacy Survey (IALS). It was therefore decided that an important part of the contribution to be made by the education specialists in the project would be to advise on two points. The first of these concerns the allocation of national data on qualifications and educational levels to a common framework. The second concerns the appropriate cut-off point which would define the low-skilled group in all the countries studied as accurately as possible.

Three papers prepared within the programme of work have been concerned mainly or in part with measurement issues connected with work on low skills. In the first of these ' Growing Skills in Europe: the changing skill profiles of France, Germany, the Netherlands, Portugal, Sweden and the UK (Murray and Steedman 1998) the definitions of educational level used in the International Classification of Education scale (ISCED) were adopted as the common framework for our project. Qualifications used in the national government surveys that were to supply data for the econometric and statistical analysis were allocated to the ISCED levels. This allocation was based on consultation among the project members and previous work on standards and qualifications in a number of EU countries. The allocation of national qualifications thus decided upon is set out in Table 1 of Murray and Steedman (op.cit).

Reasoning behind the decision about the most appropriate cut-off point for the definition of a low-skill group in Europe is set out in 'Looking into the Qualifications Black Box: What can International Surveys Tell Us About Basic Competence?' (Steedman 1999).

In this paper, stocks of qualifications, treated as a proxy for skills, were examined for six European Union countries with particular reference to the ISCED 0-2 group in each country. With the aim of reaching a definition of 'low skills' in relation to labour market prospects the size of the ISCED 0/1 group was reviewed in each country and found to vary considerably, from Sweden and Germany where almost no individuals fell within that category to Portugal where some 40 per cent of the population were at that level. It was concluded that the ISCED 0/1 group would be unsuitable as a proxy for low skills because of the low numbers in some of the EU6 countries. The ISCED 0/1/2 group (incomplete or complete primary, incomplete or complete lower secondary education) was therefore selected as a proxy for the 'low skills' group.

The remainder of the paper is devoted to analysing three international surveys of education/skill performance in order to test a) the extent to which the ISCED 0-2 group in the EU6 countries comprises individuals with low skills (as judged by tests of basic mathematical competence and varieties of literacy skill) and b) the extent to which the < ISCED 3 group in the EU6 comprises similar proportions of low skilled individuals.

Using the benchmark established for the British government's Skills Audit (Steedman, Green et.al.1997) it was found that by age 25-28 in the three EU countries included in the survey, France, Germany and the UK, similar proportions of those classified to ISCED 0-2 in each country fell below the 'low skills' benchmark used. This provided an initial indicator that, although proportions at the ISCED 0-2 level in these three countries vary, the low-skilled as a proportion within the ISCED 0-2 group is similar in each country . However, the study did not provide information on the average attainments of those in the low skills group.

Using data from the Third International Mathematics and Science Study (TIMSS), 30 simple questions requiring only basic arithmetic were selected and labelled Test A, and the performance of each of the EU6 countries on these questions was analysed. This analysis provided more insight into the basic mathematical attainments of students aged between 13 and 16 ie at the end of the period of lower secondary education. It was found that at the earlier age (13/14) only four out of thirty simple questions were answered correctly by 90 per cent or more of students in the EU6.

Questions requiring some calculations and understanding of percentage, ratio and the manipulation of fractions were beyond most students in all EU countries at this age. However, using measures of annual progress on each question derived from Test A , it was estimated that just under half of the thirty questions would be answered correctly by almost all students in France and Sweden two years later at the end of compulsory schooling. By contrast, it was estimated that students in England and Germany would still only have achieved mastery of around one sixth of the thirty questions by this stage of education. The data for the Netherlands and Portugal were not suitable for extrapolation. It was therefore concluded that real differences in basic skills attainment are emerging in EU 6 countries between the ages of 13 and the end of compulsory schooling two years later. With the possible exception of France, these were found to be broadly consistent with the differences in proportions at the ISCED 0-2 level at a later age and with the International Adult Literacy Survey (IALS) results.

The IALS data made it possible to examine the internal consistency of attainment within the ISCED 0-2 category by age and showed that in most EU countries the older age groups perform less well on the literacy tests than the younger age groups. The co-efficient of correlation of literacy level with ISCED level was not particularly high across the EU countries, indicating that literacy as defined by the IALS is not exclusively acquired in the education and training system but also through experience and learning outside of the formal system. However, the co-efficients were similar across countries indicating that the level of literacy associated with ISCED levels taken together is much the same in the EU 5 countries (Belgium (Flanders), Great Britain, Ireland, Netherlands, Sweden). When the average score for each ISCED level for each country was calculated differences between countries were greatest at the lowest point on the ISCED scale and then narrowed progressively.

The group at the lowest literacy level (Level 1) varied considerably in size between EU5 countries but, on average for the EU 5, most (85 per cent) of those who scored at Level 1 were classified to ISCED 0-2. Of those in the EU5 who were classified to ISCED 0-2 on the basis of their highest qualification, on average around two thirds (66 per cent) scored at IALS 1 and 2. This shows that around one third of the ISCED 0-2 category score higher than IALS Level 2 and is consistent with the finding of greater heterogeneity of the ISCED 0-2 group. Looking at the data another way, we can calculate the proportion of those who scored at IALS Levels 1 and 2, and who also were at ISCED 0-2 on the basis of highest qualification. In the EU 5 of those at IALS 1 and 2 on average, around three quarters (73 per cent) were classified to ISCED 0-2. The findings indicate that the ISCED 0-2 category does capture most of those with very low literacy levels and a substantial proportion of those at the two lowest literacy levels.

As far as the definition of a low-skilled group for the *NEWSKILLS* project is concerned, the ISCED 0-2 group appears to comprise a substantial proportion of the low-skilled as defined by IALS and therefore to constitute a respectable proxy for low skills. Across countries, the degree of correspondence between ISCED and IALS levels is consistent but not particularly high. The consistency across countries suggests that standards at the different

ISCED levels may not be too different across countries. However, countries' standards vary more with respect to the lowest ISCED levels (0/1/2) than at ISCED 5, 6 and 7.

The analysis of TIMSS data provides an indication of the proportion of 13-16 year olds who can answer questions of basic arithmetic correctly. Although differences between countries are small at age 12/13 they appear to widen rapidly between 13 and the end of compulsory school two years later. These developing differences are reflected in differences between the EU6 countries in proportions at the ISCED 0-2 level by age 25-28.

Other work carried out for the *NEWSKILLS* project (McIntosh 1998b) showed that prior success at the lower secondary stage was strongly associated with the decision to stay on in education post-16 in a number of EU countries. From the Test A secondary analysis it is also possible to observe such an effect since the two countries which have the highest proportions performing well on the 30 questions from TIMSS at the end of compulsory schooling (Sweden and France) also have high staying-on rates post-16. England and Portugal, with lower achievement, have significantly lower staying-on rates post-16. Germany has a high staying-on rate but rather poor performance on the TIMSS test. This could be explained by the fact that most post-16 education in Germany is provided in apprenticeship where incentives to participate external to the school are strong.

Overall, the findings of this study support the view that many of those who do not continue beyond the ISCED 0-2 threshold are likely to have a poor grasp of basic arithmetic and be inadequately equipped with the skills needed for employment and lifelong learning on the labour markets of the future. It is worrying to observe that those countries where basic skills are less likely to be mastered at school (lower secondary school) are also those countries where students are less likely to stay on for further study. This tendency slows the rate of convergence of EU countries on a population with a minimum platform of the basic skills necessary for high value-added employment and lifelong learning.

Leuven, Oosterbeek and van Ophem (1998) examine results produced by using IALS measures of skill compared to results based on a skill measure using average years of schooling, experience and experience squared. Their paper argues that the explanation of male wage inequality suggested by the IALS measure is in line with differences in the net supply of these skill groups in the countries studied. This finding contrasts with the opposite result obtained using measures based on average years of schooling etc. Using this measure, a previous paper (Blau and Kahn 1996.) found the net supply of unskilled labour in the US to be lower than in many European countries (including Germany) - a counter-intuitive finding not upheld by any analysis of relative skill stocks in Europe and the US.

We would argue that assessing skill levels on the basis of recognised qualifications obtained does not give as accurate a picture of skills as the IALS survey method but, since it does not directly equate a year of education in one country with a year of education in another, the ISCED level measure captures skill differences more accurately than years of education.

There are other advantages to using ISCED levels. Information on educational level or qualifications is collected annually or biennially in almost all industrialised countries as part of a wider survey that asks questions about earnings, employment history, training, etc. This means that the relationship of low-skills so-defined to other aspects of labour markets can be tested over a prolonged time period.

Stages of education completed or certificates awarded are also important labour market signals in their own right, used by employers and potential employees to convey information about skills and knowledge attained. This makes educational/training level a relevant measure to use when studying employers' hiring behaviour as is done in the *NEWSKILLS* study of new jobs/hires. Finally, bringing about change in educational level/qualifications lies within the scope of government policy. Measures to reduce the proportion of individuals in the 'less than upper secondary' category can be clearly formulated and their success monitored.[8]

The supply of skills: the low-skilled group across European labour markets

The changes described above have affected all advanced industrialised economies over the last two decades. But, using the ISCED scale as a measure, some countries have only quite small proportions of their populations with low skills. This means that the proportion of the population adversely affected by the fall in the demand for the low-skilled has also varied widely. Murray and Steedman (op.cit.) use data from national Labour Force Surveys from 1985-1997 to follow changes in the proportions at the different ISCED levels in the six countries studied.

Proportions at or below ISCED 2 range from around one-quarter of the population of working age in Germany and Sweden to around three-quarters of the population in Portugal. In the UK the proportion is just over half and France and the Netherlands have similar proportions — around 40 per cent. In all countries, these proportions have been falling over the period considered here, roughly 1985-1996. Lack of consistency in the classification of qualifications before 1990 means that for France and the Netherlands stocks of qualifications for 1996 cannot be compared over time prior to 1990. However, for the other countries the comparison is for approximately ten years earlier.

Over the period from 1990 onwards, Sweden had the highest annual average reduction in the proportion of the population with low skills. The UK made much faster progress in reducing low skills in the working population between 1990 and 1998 than over the longer period 1985- 1998. France and the Netherlands both show a rapid decline in low skills 1990-1997/8. Portugal lagged behind all other countries in the group with an annual average reduction in the low-skilled in the population of less than one per cent. However, for Portugal, an important indicator is the extent to which the group with primary and less than primary education (ISCED 0/1) has been reduced. Portugal reduced the ISCED 0/1 group (primary and less than primary education) by 10 per cent from 55 per cent in 1985 to 45 per cent in 1997.

This study concludes that the problem of the low-skilled is far greater in some EU countries than in others but that in all countries the low-skilled are a declining proportion of the working-age population. The decline in the share of the low-skilled has accelerated somewhat in the 1990s - mainly as a result of the improvement of young people's education levels - but on present trends only Germany and Sweden will have a low skills group of around 15 per cent of the population of working age by the year 2010. Portugal will still have around two-thirds at the low skills level and France, the Netherlands and the UK will have between one quarter and more than one third. In some countries women continue to lag substantially behind men and reasons for this continuing lag need to be explored and addressed. We conclude that only in Germany and Sweden will the problem of the low-skilled in the population of working age become of minor importance as a result of the continuing reduction in numbers.

---

[8] For more extensive discussion of issues surrounding the construction of skill indicators see OECD(1994 b) and Ashton and Green (1996).

Factors influencing participation and access to education and training

Differences between countries in the proportion of the population of working age with low skills reflect changes in the participation in education by individuals over the past fifty years. The changes that can be seen in proportions with low skills at different points in time are for the most part a reflection of increased participation over time in upper secondary education. The contribution made by qualifications gained by adults over the age of 30 to reducing the proportion of the low-skilled is negligible. This is a theme that we return to in our conclusions.

A combination of labour market factors (changing demand for skills and experience), social factors (higher living standards, changing attitudes to education) together with changes in the structure of education systems, determine participation. In all the countries studied here education systems have been modified over the post-war period in such a way as to make access to upper secondary education a realistic option for progressively larger groups of young people. However, some countries achieved an upper secondary structure that was widely accessible to all earlier than others. As a consequence of this early start those countries - Germany and Sweden in the sample studied here - have comparably lower proportions of low skills in the population.

A paper prepared for the project entitled 'The Demand for Post-Compulsory Education in Europe' seeks to explain changes in the proportion of 16 year olds, 17 year olds and 18 year olds who decide to participate in post-compulsory education (McIntosh 1998b). This study uses time series data from the six *NEWSKILLS* countries, to examine national characteristics that are associated with each country's participation rate in post-compulsory schooling. Participation in education beyond the minimum leaving age has increased in each country over the previous 20-30 years. Examining changes in other national characteristics that have been associated with such increases may offer recommendations for ways to further increase participation.

The data used was collected by a *NEWSKILLS* participant in each country. A brief description can be offered here, while the full paper contains a data appendix that more fully describes these data. The dependent variable in all following analyses is the proportion of the relevant age group who remain in full-time education after education ceases to be compulsory, that is within a recognised educational establishment such as a school or college of further education or in a recognised apprenticeship. The age groups considered were 16, 17 and 18 year olds. The samples achieved were 1969-1992 in France (with some missing years), 1970-1992 in Germany, 1969-1992 in the Netherlands, 1983-1993 in Portugal, 1970-1994 in Sweden and 1961-1994 in England[9].

As far as 16 year olds are concerned, Germany has had a high participation rate throughout the period, which has been matched by the rate in France, the Netherlands and Sweden by the end of the period. Portugal and England have seen strong increases in the late 1980s and early 1990s, but are still approximately 20 percentage points behind the other four countries. For 17 year olds, Germany again started the period with a higher participation rate, but by the 1990s, had been joined by France and Sweden with a rate over 90%. The Netherlands is not far behind these three countries, and has almost been matched by Portugal in the late 1980s and early 1990s, following a strong rise in the participation rate of the latter country. England has also witnessed such an increase, although by the end of the period it still lags the other countries. Finally considering the 18 year olds, Germany has again had the highest participation rate throughout the period, only being matched at the very end by France, at a rate of about 80%. The rate in the Netherlands shows a steady increase throughout the period, reaching approximately 60% by the mid-1990s, joined again by Portugal following a large increase in the latter's rate around 1990. England again has the lowest rate, in this case trailing the other countries by a considerable margin at less than 40%.

---

[9] The data actually refer to England and Wales, but the term 'England' will be used throughout, for the sake of brevity.

Turning to the explanatory variables, the first measured, in some way, the ratio of the earnings of those with high levels of education to those with low levels of education. The idea was that this variable measured the rewards on offer to those who stay on in education. Another variable measuring incentives to remain in education is the youth unemployment rate in each country. If there are fewer jobs available for young people, the argument is that they are more likely to remain in full-time education. A final labour market variable, available only for Sweden and England, measured the proportions of 16 year olds participating in training schemes, which offer an alternative to formal full-time education.

Prior success in the education system has been shown in cross-section studies to be a strong influence on the participation decision. This was the most difficult variable to measure consistently across the countries, due to variations in their educational systems, and in fact no relevant data could be obtained for the Netherlands or Portugal. In the remaining countries, the variable measured proportions succeeding in exams or being put into some sort of higher stream.

The consumption-good nature of education was allowed for by including a variable measuring real per capita consumer expenditure, which was intended to indicate the level or resources available to 'spend' on education.

Finally, a dummy variable was included to allow for the raising of the school leaving age in Portugal and England, from grade 6 to grade 9 in Portugal in 1986, and from age 15 to age 16 in England in 1973.

The methodology adopted for the analysis of these data involved 'state-of-the-art' time series methods, which made it possible to identify both a long-run, equilibrium relationship between the participation rate and the explanatory variables, and a mechanism allowing for short-run deviations from the long-run path.

Two problems with this analysis can be identified. First, a large number of equations are estimated, given that there are six countries, each with three age groups and 2 genders, resulting in 36 equations. To keep things manageable, and to make cross-country comparisons possible, the same estimation technique was used for each equation, even though a full time-series analysis of each equation may have suggested an alternative method. Second, there is the problem that, despite this attempt to standardise the method of analysis in each country, the results may still not be comparable across countries, because of the differences in the way the variables are measured. The problem of non-comparability is highlighted with the 'prior success in the education system' variable, but is present to a greater or lesser extent for each explanatory variable. Every effort was made in the data collection phase of the project to make the data as comparable as possible, and nothing more can be done about this problem now.

Because of the large number of equations estimated, it is not possible to comment on each one in turn in this summary. Thus, a brief overview of the results is presented here. Further details can be found in the full paper.

Due to very small sample sizes, the results for France and Portugal are not very reliable. The one plausible result is a small positive effect of the youth unemployment rate on the participation decision of 16-year-old women. Given these problems with the French and Portuguese results, the remainder of this discussion will focus on the results of the other four countries.

Taking the results as a whole, they suggest that the most important determinant of post-compulsory education choices is prior academic performance during compulsory schooling. It can be supposed that greater success during their days of compulsory schooling gives young people greater confidence in their own ability to continue their studies to a higher level. An alternative interpretation is that individuals qualify for further participation through their prior success in the education system. However, in none of the countries studied are individuals excluded from all further education courses because of previous failure, and so the former interpretation is preferred[10]. The results also suggest that the 'prior success' effect is greater for females than for males. In the long-run equations for the three countries for which a measure of 'education success' was available, this variable is the single most important determinant of female participation rates in every country and for every age group. In the short-run equations, seven significantly positive coefficients on the 'education success' variable are obtained, more than for any other variable, with five of these seven significant coefficients appearing in female equations.

For males, the 'education success' effect remains important in almost all cases, but is often superceded by other effects. In the Netherlands, the level of per capita consumer expenditure appears to be the key determinant of male education participation choices, while English males seem to be most influenced by the ratio of professional to manual earnings. In Germany, the earnings elasticities are also the largest, but are very erratic, and in the short-run equations it is the 'education success' variable which attracts a strongly significant coefficient, so that, in Germany at least, the influences on males and females are similar. The earnings and expenditure effects for females are, with one or two exceptions, much smaller than their male equivalents, frequently insignificant, and sometimes even of the wrong (negative) sign.

The most robust finding of the study is a small, positive effect of youth unemployment levels on participation rates. A long-run unemployment elasticity of around 0.1 is consistently found across countries, age cohorts and genders. The maximum size the elasticity rises to is 0.2. That the unemployment effect is of some relevance is revealed by five statistically significant short-run unemployment coefficients, one female and two male in the Netherlands, and one female and one male in Sweden.

Finally, the results of this study have little to add to the debate as to whether vocational training schemes are seen as a substitute for formal academic education, or whether they act as a complement to school education for the less academically gifted, who would not have stayed-on anyway. Data on young people's participation in training schemes could only be obtained for Sweden and England. The long-run equations in those two countries show very little relationship between the proportions of a cohort participating in formal education and training programmes. In the short-run equations, there is one statistically significant coefficient for 17 year old men in Sweden, the negative sign of which suggests that vocational training may act as a substitute for formal education, but not too much can be read into this one coefficient.

The results presented above suggest various policy implications. The key result is that prior success in the education system has a positive effect on staying-on rates. Thus, it is important to concentrate on young people early in their lives, as their performance during the years of compulsory schooling seems to affect their future decisions concerning the continuation of their education. For example, in Sweden the decision whether to join the academic or the general stream is taken in year 6 of the Comprehensive school, and is presumably decided on the basis of performance even earlier in the school career. In England, 'prior success' was measured by exam success at age 16, but even in this case, results at that age will usually be the product of the decisions and efforts of earlier years. Such a conclusion is consistent with Swedish evidence that it is possible to predict who will drop out of education on the basis of characteristics at a young age (Murray, 1997). If countries want to produce a well-qualified population, it would therefore seem important to consider the earlier years spent by individuals in the education system, as well as their final years.

---

[10] An alternative interpretation, that cannot be ruled out with the current data, is that prior success is endogenously determined, and thus the causation runs from participation to this variable. If individuals decide at a young age that they want to continue their schooling beyond the minimum leaving age, they may put more effort into their studies, and so achieve greater success in the compulsory stage of schooling.

The results on the wage ratio variable suggest that widening the gap between wages paid to well-educated individuals and wages paid to less well-educated individuals can influence young people to continue their education beyond the compulsory stage, particularly males. Of course, the social consequences of such widening wage inequality may outweigh the benefits on the participation rate.

Finally, the results show that rising youth unemployment has had a part to play in the increasing participation in post-compulsory education in Europe, although the size of the estimated effect is small. Thus, if jobs were to be made available for young school-leavers, this should not significantly affect the participation rate in post-compulsory schooling. The most likely reason for this result is that those who want to continue their education do so regardless, and are not swayed in their decision by low-paying jobs available to young low-skilled people on the labour market.

Training provided by employers also makes a contribution to upgrading low skills. A paper entitled 'The Determinants of Vocational Training' (McIntosh 1999) investigates who receives workplace training in the six *NEWSKILLS* countries.

Other projects in our research have identified who the low-skilled are in each country. The idea of this study was to examine what is being done to improve the level of skills and to generate new skills. In particular, is it low-skilled individuals who receive the most training, in an attempt to pull them up to a level high enough for them to participate fully in the modern labour market, or do countries concentrate on offering training to individuals who already have a high level of developed skills, and who have demonstrated their ability to learn? The consequences of this choice should be clear for the position of the low-skilled. Also of interest, for building up a picture of the training being offered, are the characteristics of the jobs being done by individuals who receive training, as well as the characteristics of the individuals themselves.

The data for this project were taken from the 1995 European Labour Force Survey (ELFS), obtained from Eurostat. Data for France, Germany, the Netherlands, Portugal, Sweden and the UK was analysed. The ELFS contains four questions related to workplace training. The key question asks whether the respondent has received any education or training in the four weeks prior to the survey. Of the list of possible responses, two relate to workplace training, namely whether individuals have 'received specific vocational training in a working environment (without complementary instruction at a school or college)' or 'received specific vocational training within a system which provides both work experience and complementary instruction elsewhere'. For the purposes of the analysis here, individuals who answered in the affirmative to either of these questions were categorised as being in receipt of on-the-job and off-the-job training respectively. A composite training measure was also constructed that indicated an individual who had received either form of training in the previous four weeks. The remaining questions were asked of those who had undertaken a training spell within the given period, and determined the purpose of the training (initial or continuous), and its length, in terms of number of weeks and hours per week.

There are a few things to note about the ELFS data. First, it is not entirely clear what kinds of training are included within these definitions, since there is no question asking about financing of training. Thus, for example, it cannot be determined whether government sponsored training is included. The fact that the question only asks about a four week period is another problem, since it tells us nothing about total human capital accumulation. All the 'snapshot' data reveal to us is who is more likely to receive training in the specified four week period. Third, Eurostat do not provide data on individuals, but only in grouped form, specifying the (weighted) sum of respondents who share each permutation of the variables requested for analysis. Also, the ELFS data are supposed to be comparable across countries, but this is not always the case. Of particular relevance to this research is that in France and Portugal, an incidence of training is only recorded if it is actually underway at the time of the survey, rather than at any time in the four weeks prior to the survey, as in the other countries. In addition, exclusively in-house training is excluded in France.[11]

Despite these problems, the advantages of the ELFS for this analysis are clear: different types of training can be identified, questions about the intensity of training are included, and cross-country comparisons are possible.

Because of the nature of the data as supplied by Eurostat, in the multivariate analysis, the unit of observation was each permutation of the explanatory variables. The dependent variable was the proportion of individuals with this set of characteristics who had received training. To take account of the grouped nature of the data, a regression technique was used that weighted the observations according to the number of individuals in that cell. For small cell sizes (ie unusual combinations of characteristics not shared by many people) the dependent variable may not be an accurate measurement of the proportion of people with such characteristics to have received training.

The country with the highest training rate is Sweden, where 10.5% of employees received some sort of training in the four weeks prior to the survey (all analyses are for employees only) . The next highest rate is found in the UK (7.3%), followed by the Netherlands (5.3%) and Germany (4.9%). The training rate is less than 1% in France and Portugal, but refer to the data problems in these two countries, as outlined above.

Turning to the cross-tabulations, there is little difference in the training rates between men and women, although this fact, together with the greater labour force participation of men, means the majority of training incidences go to men.

Large differences with respect to age exist, with the young being most likely to receive training in the four week period in all countries except Sweden. The differences are most stark in Germany, where two-thirds of all 15-20 year olds in employment receive some training in the four week period. France and the UK both have one-quarter of their 15-20 year olds receiving some training, with the differences across age groups being smaller in the Netherlands and Portugal. In Sweden, it is the 41-50 year old age group who have the highest training rate.

Prior education level also provides some very interesting results. The usual result found in the literature is that the well-educated are more likely to receive further training, and this is found for Portugal, Sweden and the UK in the ELFS. In Germany and France, however, it is the low-skilled who are most likely to receive training, with 70% of all training incidences going to this group in those two countries. A quarter of all German employees with low or no qualifications received some training within the specified period. Finally, in the Netherlands, the group with the highest training rate is those with middle-level qualifications.

---

[11] A final problem is the issue of proxy interviews, whereby if a designated respondent is not present when an interviewer calls, a member of the respondent's household is asked to answer for them. While this may not present a problem for questions concerning, for example, labour market status, proxy respondents may be less sure of any training received by the required respondent, particularly if the training was informal and on-the-job. The problem is exacerbated by the fact that proxy interviews are most often used for young respondents, who are the very group most likely to receive training.

The effect of prior tenure with an employer differs across countries. In Portugal and Sweden, it is employees with the longest tenure who are most likely to receive training, in Germany and the Netherlands it is the middle tenure group, while in France and the UK it is those who have been with their employer less than one year. None of the differences across tenure groups appear to be too large, with the exception of relatively low training rates for those with the longest tenure in Germany and France.
Turning to job status, full-time employees are more likely to receive training in all countries except France and Portugal, where we know there are data problems. With respect to temporary or permanent status, employees in the former category have a higher rate of training in Germany, France and Portugal, while the reverse is true in the remaining three countries. The differences are particularly large in Germany and France, where the proportion of all training incidences going to those on fixed-term contracts is 84% and 91% respectively.

Considering the size of the establishment, training appears to be more likely to occur in small establishments, somewhat surprisingly, although the differences in training rates across establishment sizes are not large.

Finally, industry and occupation reveal some interesting patterns. In Germany and France, the industries and occupations with the highest training rates are typically manual and traditionally low-skill, such as construction, wholesale/retail trade and hotels and restaurants with respect to industry, and craft workers, shop workers and agricultural workers in terms of occupation. In the Netherlands and the UK the same industries and occupations emerge as frequent trainers, but they are joined by more professional, high skill industries, such as finance, health/social work and education, and occupations such as professionals and technicians or associate professionals. In Sweden in particular, and to a lesser extent in Portugal, it is the latter, professional industries that dominate in terms of their training rates.

When a multivariate analysis was performed, analysing the impact of each of the above variables holding all others constant, very much the same results were obtained in terms of the important determinants of training receipt in each country. When the analysis was restricted to 21-64 year olds, thus excluding the youngest age group, the same results continued to hold, although the differences in the likelihood of training across categories of the age and prior education variables narrowed, particularly in Germany.

When the training variable was split into exclusively on-the-job training, and training with an off-the-job component, some differences in the determinants did emerge. The key differences are on the age and prior education variables. The finding that the young are most likely to receive training is revealed to be particularly the case for training with an off-the-job component. The differences in the likelihood of training receipt across age groups are much lower when exclusively on-the-job training is considered, although even in this case the coefficients remain statistically significant in the case of Germany and the Netherlands. The negative relationship between prior education and the likelihood of training receipt observed in Germany, France and the Netherlands is found only to occur in training with an off-the-job component. When exclusively on-the-job training is considered, the more usual positive relationship between these variables is observed in Germany and the Netherlands (there is no such training recorded in France). In the UK the positive effect of prior education on the likelihood of training receipt, noticed with respect to the overall training variable, is observed only for exclusively on-the-job training.

Turning next to the intensity of training, it is most intensive in Germany, of the six countries considered here. Over half of all training incidences reported in Germany last for at least one year, and over 75% comprise at least 21 hours per week. Just over one in five training spells in France last for one year or more, with this figure being just over one-tenth in the Netherlands and Portugal. France and Portugal are also quite close in terms of hours per week, with about one-half of training spells involving over 20 hours per week. However, on this measure the Netherlands joins the two low intensity countries, Sweden and the UK, with over 90% of all training incidences falling into the '20 hours per week or fewer' category. In Sweden, three-quarters of all spells last a week or less, with a further 17% lasting no longer than a month, while 16% comprise over 20 hours per week. The UK appears to have the lowest intensity, in that 86% of all training spells last for one week of less, and 80% are for 20 hours or less a week.

Differentiating between exclusively on-the-job training and training with an off-the-job component, the latter type typically lasts longer. In all countries, the majority of on-the-job training lasts for a month or less, and is for 20 hours per week or less. The ordering across countries in terms of length remains the same as that for the composite training measure. With respect to training with an off-the-job component, we observe two-thirds of all such training spells lasting for a year or more in Germany, and almost 80% taking up over 20 hours per week. Germany is followed by the UK, where one-half of off-the-job training spells are of over one year in duration, with 45% being for more than 20 hours per week. France, the Netherlands and Portugal all have just over 20% of off-the-job training spells lasting longer than a year, though in terms of the proportion of spells comprising 20 hours per week or more, the countries differ, this proportion being 77%, 51% and 5% in Portugal, France and the Netherlands respectively. Even when training with an off-the-job component is considered, the spells remain very short, on average, in Sweden.

The final piece of analysis constructed a very approximate measure of the average training spell length in each country, using the mid-points of the time categories. When the training provided by all employers was considered, including those who provide zero, the results reveal that spells are longest on average in Germany. Therefore despite Germany's low incidence of training, compared to some other countries, this is offset by the intensity of its training, so that there is more training in that country than in any other considered here. The UK is second, benefiting from a high incidence rate. France and Portugal suffer from their low incidence rates, due to the data problems outlined previously. When training times are averaged across only those in receipt of some training, thus abstracting from the incidence issue, the dominant position of Germany is strengthened, followed by France, Portugal and the Netherlands, with the UK falling to fifth place. Sweden has the shortest recorded training spells on average. Differentiating between exclusively on-the-job training and that with an off-the-job component, the longer nature of the latter is again revealed, and the relatively better position of the UK with respect to training with an off-the-job component is shown.

The findings reveal the different nature of training provision in the six *NEWSKILLS* countries. Training in Germany, in general, involves the intensive initial training of young, low-skilled individuals in traditionally lower-skilled or craft industries and occupations. The trainees typically have temporary contracts, and most of the training is off-the-job. Most of the trainees in Germany therefore seem to be part of the German apprenticeship scheme. The picture appears to be similar in France, if less intensive, although this is not surprising and is probably a distortion, as only training with an off-the component is included. At the other end of the training spectrum is Sweden, where most training appears to be short 'top-up' courses supplied to middle-aged, well-educated individuals in professional occupations and industries. The remaining countries, the Netherlands, Portugal and the UK, appear to have an on-the-job area of training similar to that in Sweden, and an off-the-job training sector similar to the German model.

The pattern of training across the six countries seems to be determined by the system of education in each country. Thus in Germany, vocational training is not offered in school, but there exists a strong system of apprenticeship training offered to those who do not succeed in school, so that there is a 'safety-net' which largely prevents young people emerging onto the labour market with no skills. France also has an apprenticeship scheme, although it is less developed than the German version. In the Netherlands, vocational training is offered either in school or through apprenticeships, and so we observe two types of trainees in that country, one type matching the typical German trainee, and the other the typical Swedish trainee. Training places in Sweden are not taken by young unskilled individuals, but that country provides good vocational training within the formal education system, so young people do not emerge from school with no skills in the first place. In all four countries mentioned, there are therefore mechanisms in place for training the young unskilled. The problems exist for the unskilled when there is no vocational training offered within formal education, and inadequate provision of suitable training after school. This would appear to be the case in the UK. There are new training initiatives being established in that country, and off-the-job training, where provided, is second only to Germany in terms of length. The problem seems to be however, that there is insufficient such training provided in the UK, with most training being similar to the short courses offered to older, skilled, professional individuals in Sweden. Not having Sweden's provision of vocational training within formal education, however, there remains a higher proportion of unskilled individuals in the UK than in the other countries studied here, with the exception of Portugal.

The *NEWSKILLS* project also examined the supply of and demand for work-related training in a paper entitled 'Demand and supply of work-related training: Evidence from four countries (Leuven and Oosterbeek 1997) using data from the IALS survey. The first phase of this work covered the Netherlands, Switzerland, Canada and the United States (data problems prevented the inclusion of Sweden and Germany). The second phase of the study used data for the UK. A key finding of this paper is that in all four countries firms appear to contribute to the costs of training which is likely to be useful in other firms as well (so-called general training). This contradicts one of the early insights in the economic theory of training but is in line with findings from other empirical studies. The second part of the paper presents results from an attempt to disentangle demand and supply of training. To that end information is used about workers who report that they are constrained in their training choices (they wanted more training than they actually received). A key finding of this analysis is that - again in all four countries - workers with lower levels of initial education receive less work-related training because they seem to be less interested in taking training, and not because firms want them to take less training than more highly educated workers.

The finding that firms are paying for general training suggests that one source of possible failures in the training market is probably less of a problem than is often thought. That is, it is often argued that there is a failure in the training market because workers have to pay the full costs of general training but are unable to do so because they face liquidity constraints. To the extent that firms pay these costs, this problem does not arise. The finding that lower training participation rates of lower educated workers are the result of the workers' preferences and not the firms' preferences suggests that policies to raise the training rates of these workers should be targeted at workers and not at firms. From this perspective the recent Dutch policy to provide firms with tax deductions for training their workers is unlikely to be successful.

What accounts for the fall in demand for the low-skilled?

The debate on the causes of the falling demand for the low-skilled centres around whether the shift is caused mainly by the role of competition from industrialising economies (Wood 1994) or by the increasing role of technology in production (Berman, Bound and Machin 1998). Section 2 above provides a fuller literature overview. Whatever the relative weight of these explanations most economists now accept that the following factors are important. First, the more efficient exploitation of information and control technology based on the microchip has helped to reduce the demand for much routine semi-skilled and unskilled work. Second, competitive pressures have increased within national economies in both the non-traded and traded sectors. These pressures have put a premium on improvement in the variety and quality of goods and services and account for much of the 'within-industry' increase in the demand for more highly educated workers. In the traded sectors of the economy greater competitive pressures have resulted from the great increase in world trade. Companies are forced to become more efficient in order to compete internationally and this means adopting and exploiting fully all new technological aids to productivity. And to exploit fully the productive potential of new technology and thereby retain competitive advantage firms require highly-skilled employees.

The multi-dimensional nature of labour demand

An analytical framework for empirical assessment of these issues has been developed as part of the work for the *NEWSKILLS* project by Mellander (1998) in a paper entitled 'The Multi-Dimensional Nature of Labour Demand and Skill-Biased Technical Change'. The model has been applied to a dataset covering 24 industries in the Swedish manufacturing sector over the period 1985-1995. These data make it possible to identify the demand for labour with different levels of education.

Four categories of labour are identified: workers with level of education given by ISCED 0/1, ISCED 2, ISCED 3 and ISCED 5/6/7, respectively. The separate treatment of ISCED 0/1 and ISCED 2 workers is primarily motivated by the fact that the age structure differs sharply between these two groups. For the manufacturing sector as whole, almost 95 percent of the ISCED 0/1 workers were at least 40 years in 1990, while for ISCED 2 more than 70 percent were below 40.

It was originally planned to carry out this study not only for Sweden but for all the *NEWSKILLS* countries for which suitable data could be collected. However, data collected for the UK proved to be of insufficient quality for the analysis and suitable data was not available for the Netherlands, Portugal and Germany. A suitable dataset was compiled for France but required a great deal of cleaning before it could be used. That work is still on-going. Consequently the results reported below relate only to the manufacturing sector in Sweden. For brevity only the results for the whole manufacturing sector will be discussed here. A discussion of industry level results can be found in Mellander (op.cit.).

The first question that the paper seeks to answer is what is the main driving force behind the fall in the demand for low-skilled labour in the Swedish manufacturing sector, since the mid 80's? Is the main factor competition from low-wage countries or skill-biased technical change? A more extended discussion of this general issue can be found in Section 2 above. Here, the findings of this new study of Sweden are reported.

To shed light on this issue, decompositions of changes in employment shares into between industry and within industry changes are conducted for employees with ISCED 0/1, ISCED 2, ISCED 3 and ISCED 5/6/7 levels of education. The decompositions follow the set-up of Berman, Bound and Griliches (BBG, 1994). Just like BBG -- and like numerous similar decompositions carried out in different countries and for varying time periods -- it is found that between industry changes are totally dominated by within industry changes. The contributions of within industry changes to the total changes in employment shares range between 93% and 99%, depending on the category of labour and the time period studied.

According to BBG, dominance of within industry changes indicates that skill-biased technical change is more important than competition from low-wage countries. Actually, the underlying argument is rather more indirect. If competition from low-wage countries were important then between industry changes should be important. The fact that they are not, indicates that something else matters more and skill-biased technical change is a natural candidate. The next step is therefore an analysis in which skill-biased technical change can be explicitly modelled and tested.

The necessary analytical framework requires two building blocks: a disaggregated specification of labour and a representation of the production technology. Labour is specified according to

Li = Ni * Bi where i = 1, 2, 3, 4 for ISCED 0/1, ISCED 2, ISCED 3, and ISCED 5/6/7, respectively.

Ni denotes number of employees and Bi a "quality" index, which is a function of age, sex, immigrant status, work hours, and fields-of-study. The product of Ni and Bi, i.e. Li, might be called "effective labour". The quality index Bi is normalised to unity in the year 1991. Note that if the quality index Bi is larger than 1 then effective labour exceeds the number of employees Ni, and vice versa if the quality index is smaller than 1. This specification of labour constitutes a parsimonious way to account for the fact that labour has many dimensions beside the level of education.

The technology is represented by the variable cost function, VC, the general form of which is given by

VC = f(Y, PL1, PL2, PL3, PL4, PE, PM, S, t)

where Y is (gross) output, PE is the price of capital in the form of Equipment, PM is the price of Materials and intermediate goods, S is the stock of capital in the form of Structures and t is a time index, representing technical change. The factors of production that enter the cost function by means of their prices, i.e. all categories of labour, equipment capital and materials, are variable factors. This means that their utilization can be adjusted in response to, e.g., changes in relative factor price within a (calender) year. This time span, 1 year, defines the short run in the analysis. The structure capital, S, is quasi-fixed as its utilization cannot be adjusted within one year. The empirical analysis generates estimates of the long run, equilibrium, values of S, denoted by S*. This makes it possible to compare short run results, corresponding to the observed stock of structures, S, with long run equilibrium results, associated with S*.

From the variable cost function factor demand equations are derived. In the labour demand equations, skill-biased technical change is captured by means of interaction variables involving Y, t and the Bi. As a result of the inclusion of the Bi, the estimates of the skill biases for the four categories of labour control for the categories' characteristics in terms of age, sex, immigrant status, work hours and fields-of-study.

Using a time index might seem a crude way to capture technical change. It is, however, not inferior to approaches using specific indicators of technical change, such as, e.g., measures of computer use. By construction, such proxies can only capture specific aspects of technical change. For example, a computer use indicator will not pick up effects of changes in work organization schemes. By modelling technical changes by a time index we are, in effect, capturing everything that changes over time and cannot be explained by (functions of) the other variables in the cost function. Put differently, we are capturing the Solow residual.

Before turning to the estimated skill biases, we consider the results of accounting for the multi-dimensional nature of labour demand. Do worker characteristics as measured by the 'quality' indexes, i.e. the Bi, matter for labour demand? It is found that the answer to this question is positive, in the sense that some of the factors included in the quality index significantly contribute to explain variations in labour demand.

In particular, the age distribution matters for all of the four categories of labour. With respect to ISCED 0/1 labour, the younger the individuals the more they contribute to effective labour. This result is somewhat surprising. It might have been supposed that experience should be quite important, which suggests that the older the individuals the more they would contribute to effective labour. For ISCED 5/6/7 the results are just the opposite to those for ISCED 0/1. That is, older workers with ISCED 5/6/7 are preferred to younger workers. For ISCED 2 and ISCED 3 the results are mixed in that the contributions to effective labour do not increase or decrease monotonically with age. Perhaps one could interpret the results, especially when comparing ISCED 0/1 and ISCED 5/6/7, as simply saying that it is easier to accumulate valuable work experience if you have a good education to start with.

The gender structure also plays a role. Males contribute more than females to effective labour with respect to workers with education levels ISCED 0/1, ISCED 2 and ISCED 3. For ISCED 5/6/7 there is no difference between males and females.

Fields-of-study, which can be distinguished for ISCED 3 and ISCED 5/6/7 labour, also affects labour demand. As expected, employees with educations in engineering and natural sciences contribute more to effective labour than workers who have specialized in other fields. The results are mixed with respect to business administration and law. An interesting result is that ISCED 3 workers with a 'general education' contribute much more than their share to effective labour. Many of these are individuals that have taken programs in upper secondary school that are intended as preparations for university studies, but for some reason decided not to on to higher education.

On the whole, the share of immigrants among the workers does not seem to be very important. Neither does the incidence of part-time work in the sense that no differences in can be found contributions to effective labour per hour worked between those working part-time and those working full-time.

The main conclusion to be drawn from this part of the analysis is that it is important to account for the fact that the age structures of the ISCED 0/1 and the ISCED 2 categories are very different and that these differences have quite different implications for labour demand. In particular, attempts to replace older workers (over 50) with young workers (below 30) will have a positive net effect on the demand for ISCED 2 workers but a negative effect n the demand for ISCED 1 workers. This result is due to the fact for ISCED 0/1 workers the contributions to effective labour vary inversely with age while for ISCED 2 workers the younger ones contribute less than the old ones.

It might be supposed that controlling for demographics and other characteristics of labour would reduce the role of skill-biased technical change as the main driving force behind the fall in the demand for low-skilled workers. Judging from this study, this does not appear to be the case, however.

Skill-biased technical strongly decreases the demand for ISCED 0/1 workers and does so at an increasing rate. Compared to the average effect of technical change on the demand for all inputs, the reduction is 4 percent per year in 1986 and 16 percent per year in 1995.

Technical change saves on ISCED 2 workers as well but here the effect is much less dramatic: the relative reduction is 2 percent in 1986 and 5 percent in 1995.

For ISCED 3 the relative skill bias is small and stable, reducing demand with around 1 percent per year, during the whole period.

Only for ISCED 5/6/7 individuals is the relative skill bias positive. In 1986 technical change increases the relative demand for this category by 5 percent. This rate then falls very slightly over time to end up at 4 percent in 1995.

What are the implications of these skill-biases in terms of number of people? To give an example, in 1995 skill-biased technical change reduces labour demand for ISCED 0/1, ISCED 2, and ISCED 3 by approximately 21, 000, 7,500, and 11,500 individuals, respectively. As the corresponding increase with respect to ISCED 5/6/7 only amounts to 3,000, the total effect of skill-biased technical change in the Swedish manufacturing sector is a fall in demand by 37,000, or almost 5 percent of the workforce.

Technical change can be biased with respect to non-labour inputs as well. In this study, technical change is found to be positively biased with respect equipment capital. This to be expected as equipment includes, e.g., computers. The effect is comparatively small, however; just above + 1 percent per year. Finally, there is an even smaller positive effect with respect to materials and intermediate goods -- the rate of induced increase in relative demand is about + 0.5 percent annually. Possibly, this effect reflects a tendency to buy semi-finished goods from abroad instead of buying raw materials to be handled by (domestic) low-skilled labour.

The effects just considered are the long-run biases in technical change. These are so close to the short-run effects, however, that there is no need to report the latter separately.

The findings with respect to technical change can be summarized as follows. Technical change hurts the demand for low-skilled workers and hits harder the lower their education; in percentage terms the effect on ISCED 0/1 workers is more than twice the effect on ISCED 2 labour. Only with respect to ISCED 5/6/7 is the skill bias positive, implying that technical change increases the relative demand. In addition to skill-biases, there are also non-labour biases in technical change in that it increases the relative demand for equipment and intermediate goods. These effects aggravate the negative demand effects for low-skilled labour even further.

Next to technical change, the most important factors explaining labour demand are relative labour costs. The corresponding effects can be conveniently expressed in terms of price elasticities of demand. For a given category of labour, the own-price elasticity tells by how many percent labour demand is affected in response to a 1 percent change in the labour cost of the same factor. Similarly, the cross-price elasticity indicates how much demand for one category of labour changes in response to a change in the cost of another category of labour. While own-price elasticities must always be negative cross-price elasticities can be either positive, in which case the two categories are substitutes, or negative, indicating that they are complements.

With respect to price elasticities of demand, the results indicate that the distinction between the short run and the long run is important. Both the short run and the long run elasticities will therefore be reported. We first consider the own-price elasticities.

For all but the ISCED 5/6/7 category, the estimated own-price elasticities are high, indicating that labour demand for these categories is sensitive to changes in labour cost. In particular, this is the case with respect to ISCED 0/1 workers. For these the short-run own-price elasticity is about -1.2 in 1986 and then decreases even further over time, reaching -3.6 in 1995. This means that over this period, demand has been elastic: a 1 percent decrease in labour costs would have increased demand by more than 1 percent. The long-run effects are even more dramatic; the long-run elasticity decreases from -1.7 in 1986 to - 6 in 1995.

For ISCED 2 workers the corresponding elasticities are much smaller and, in further contrast to ISCED 0/1 workers, there is virtually no distinction between the short-run and the long-run effects. Both decrease from about - 0.8 in 1986 to - 1.5 in 1995.

For ISCED 3 labour the short run own-price elasticity is close to unity and falling slightly over time. The long run elasticities are well below -1 during the whole period.

ISCED 5/6/7 labour differs from the other categories in that demand is clearly inelastic, both in the short and in the long run. The short run elasticity increases from - 0.4 to - 0.2 between 1986 and 1995 and the long run elasticity goes up from - 0.6 to - 0.4 over the same period. Demand thus becomes increasingly inelastic over time which is just the opposite of the developments found for ISCED 0/1 and ISCED 2 labour.

The high price elasticities of demand for low-skilled workers, especially for ISCED 0/1, suggests that measures decreasing labour costs might be an efficient way to alleviate the fall in demand caused by technical change. However, when considering, e.g., wage subsidies it is necessary to examine the cross-price elasticities as well, as changes in the labour costs of one category of labour will affect the demand for the other categories, too.

As the focus here is on the low-skilled, we will just consider the cross-price elasticities between ISCED 0/1 and ISCED 2 labour. To evaluate the demand effects a simple thought experiment will be carried out: assume that in 1995 the wage costs for either ISCED 0/1 or ISCED 2 labour are cut by 1 percent. (As it happens, the costs associated with these two alternatives are almost equal.) What will the net labour demand consequences be for these two categories taken together?

The cross-price elasticities giving the effect on the demand for ISCED 2 labour in response to a 1 percent wage change for ISCED 0/1 labour are 1.77 and 1.95 in the short and long run respectively. Accordingly, a 1 percent wage cut for ISCED 0/1 labour reduces the short and long run demands for ISCED 2 by 1.77 percent and 1.95 percent, respectively. Applying these cross-price elasticities and the own-price elasticities for ISCED 1 workers discussed above to the number of employed ISCED 0/1 and ISCED 2 workers we get the following result. In the short run the demand for ISCED 1 workers increase by 4,100 individuals, while the demand for ISCED 2 workers falls by 2,100. The short run net effect is thus to increase the demand for ISCED 0/1 + ISCED 2 workers with 2,000 individuals. In the long run, ISCED 0/1 demands goes up by 7,200 workers, whereas ISCED 2 demand is reduced by 2,300, yielding a net demand increase of 4,900 workers. Thus, in both the short run and in the long run the total demand for low-skilled workers increase as a result of the 1 percent wage cut for ISCED 0/1 labour.

The cross-price elasticities showing how the demand for ISCED 0/1 is affected by a change in the cost of ISCED 2 workers are 1.83 in the short run and 2.01 in the long run. Together with the own-price elasticities for ISCED 2 labour these elasticities imply the following result of a 1 percent wage cut for ISCED 2 workers. In the short run, demand for ISCED 2 increases by 1,800 while demand for ISCED 0/1 workers falls by 2,100. The net effect is thus a reduction in total demand for low-skilled workers by 300 individuals! The long-run outcome is even worse: demand for ISCED 2 goes up by 1,800 but demand for ISCED 0/1 is reduced by 2,400, implying a net effect equal to - 600.

Thus, marginal wage reductions for ISCED 0/1 workers will be effective in the sense that the increased demand for these workers is not off-set by reductions in the demands for ISCED 2 workers. In contrast, marginal wage reductions for ISCED 2 workers will increase the demand for these workers by less than it decreases the demand for ISCED 0/1 workers.

The following policy conclusions can be drawn from this study. When designing measures to alleviate the reductions in the demand for low-skilled workers caused by skill-biased technical change it is important to account for the substantial differences between workers with ISCED 0/1 and ISCED 2 level educations.

With respect to the ISCED 0/1 category the negative skill-bias is so large that it is doubtful whether it can be countered by skill up-grading. Also, attempts to replace older workers by younger will not have a positive effect on the demand for the group as a whole. The very high sensitivity in demand to wage changes might, however, be exploited. Marginal wage subsidies to SCED 0/1 workers will increase the demand for these workers and do so without creating off-setting demand reductions for ISCED 2 individuals. The problem of providing perverse incentives to ISCED 0/1 individuals to remain low-skilled is not very serious because the subsidies can be designed for older workers that are not far retirement age. In fact, the ISCED 0/1 group is completely dominated by older workers.

With respect to ISCED 2 workers, the effects of skill-biased technical change are less severe, making the prospects for skill up-grading better. For this category, measures intended to lower wage costs is not a good strategy since the resulting demand increases will be more than off-set by decreases in the demand for ISCED 0/1 workers.

Explaining demand for 'low skills' in Portugal

A paper prepared by Carneiro and Conceicao (1998) examines two contrasting manufacturing sectors in Portugal, shoe manufacture and the electrical and electronics industry. Despite evidence (for example, Mellander op.cit. above) that, in general, computer and information technology illiteracy, as well as low levels of education, are likely to lead to economic exclusion, the paper shows that the specific situation in Portugal has not conformed to this tendency.Despite evidence that, in general, computer and information technology illiteracy, as well as low levels of education, are likely to lead to economic exclusion, we show that the specific situation in Portugal has not conformed to this tendency. On the one hand, a *traditional* sector (shoe and leather industry) has been able to prosper by generating competitive firms, by incorporating critical advanced technologies and by securing and expanding jobs with very low levels of formal education. On the other hand, a *modern* industrial sector, the electric and electronics industry, has only been able to remain competitive by developing and incorporating technology, in conjunction with the absorption of comparatively much higher levels of human capital, and with the adoption of information technologies. We try to interpret the asymmetric behaviour of these two representative Portuguese industrial sectors by hypothesizing that they have suffered different learning dynamics. While the traditional sector has relied on informal methods of knowledge accumulation (basically, learning-by-doing dynamics), the modern sector has based its competitiveness on formal education and institutionalized innovation activities. Therefore, a strong case can be made in favour of a nation-wide recognition and accreditation scheme of non-formal competencies, mainly acquired through firm-based work experience. Such a scheme could play a decisively inclusive role in a social setting characterized by a wide generation gulf measured by differential opportunities in accessing formal schooling and resulting labour market polarization. However, the recent evolution of the traditional sector, and the prospective analysis expressed by the respective sector's leaders, reflect a growing demand for managerial skills and for qualified employees, associated with an increased technological sophistication for the value chains, especially within the most innovative firms. Consequently, it is not clear whether the learning-by-doing marginal returns in the traditional sector are diminishing. Such an exhaustion of the growth potential awarded by learning-by-doing dynamics could require higher levels of formal education, in order for the sector to acquire the "cognitive" resources needed to deal with new knowledge. If this process is representative of what other Portuguese traditional sectors are facing, exclusion of the low skilled workers could increase sharply in the near future in Portugal. This trend, in line with the generality of other European countries, would call for a vigorous life-long policy targeted at the lower skilled echelons for the working force. Likewise, the paper provides strong arguments in favour of the design of early safely nets for low-achievers in the school system, along the lines of flexible learning systems combining firms and schools in a concerted effort to bridge codified and tacit knowledge.

Institutional factors and the demand for skills

Comparative labour demand analysis is scarce partly because it is non-trivial to incorporate institutional differences into such analysis and partly because of the lack of comparable data. In a companion paper (Kazamaki Ottersten, 1998) to Mellander (op.cit) a number of differences in the institutional settings in the labour markets of the countries studied in the *NEWSKILLS* project are examined. Institutional dimensions are divided according to categories where the first refers to the price-quality dimension, the second to the degree of regulation within the countries, the third to the degree of influence and the fourth to the degree of transaction costs. The fourth dimension incorporates the three previously mentioned dimensions and hence can be seen as a broader framework. Within this setting we focus on a number of variables which we compare between the countries, the unemployment situation, the distribution of wages, job protection legislation, practice on minimum wages, the duration of unemployment benefits, trade union density rates, and the regulation of temporary forms of employment contracts.

Ratios of earnings by educational level are also examined in the respective countries from 1970 to 1990. Clearly there are a number of differences between the countries on several of these dimensions. This makes the comparisons at the same time both challenging and compelling. For example, Portugal and Sweden are countries with very different institutional structures, the descriptive analysis, however, finds both differences and similarities between these two countries.

Given the nature of the different institutions, a number of institutional factors will be brought into the labour demand analysis in order to assess the effects of such factors. One example is the strictness of labour market legislation. This issue has been intensively debated in recent literature. In terms of the strictness of employment protection legislation there are rankings which suggest that such legislation is relatively low in the UK, high in Portugal and intermediate (or high in some classifications) in the Netherlands, France, Sweden and Germany.

There are various practices in these countries and even, for example, if Sweden is classified as a country with moderate employment protection legislation, certain practices, for example the last-in first-out principle by legislation sets very strict bounds on the terms of dismissal. On the other hand, in terms of the regulation of temporary forms of contracts it appears that the overall strictness in Sweden is the lowest in reference to the countries that are included in the study. There are many dimensions that are interesting to study here, and these will be used to interpret differences in the results when the model developed in Mellander (op.cit.) is extended to other countries. This would make it possible to make some allowance for the institutional differences described above which may influence the demand for labour.

The role played by institutional factors in determining the rewards for skills is also considered in a paper prepared for the *NEWSKILLS* project entitled 'Explaining International Differences in Male Wage Inequality by Differences in Demand and Supply of Skill' (Leuven, Oosterbeek and van Ophem 1998). This paper examines previous work by Blau and Kahn (1996) in which male wage inequality is compared across countries. A key finding by Blau and Khan is that the relatively worse wage position of the low-skilled in the US cannot be attributed to a relatively large net supply of this skill group in the US. Instead they conclude that differences in labour market institutions between countries cause the larger wage dispersion in the US. Using an alternative skill measure (see below) and repeating the Blau and Kahn analysis, Leuven et. al. find results that are the exact opposite of the Blau and Khan analysis.

Leuven et.al. find that international differences in wage inequality between skill groups are in line with differences in the net supply of these skill groups. The implications of these findings are the following. First, Blau and Kahn reach their conclusion that labour market institutions cause differences in wage dispersion, by implicitly assuming that educational institutions are irrelevant (a year of schooling in the US equals a year of schooling in Germany). The result obtained in the paper by Leuven et. al. supports the view that differences in educational systems do matter. Second, according to Blau and Kahn it is feasible to protect the wages of the low-skilled by implementing the right labour market institutions, since their results suggest that the lower wage inequality in the European countries relevant to the US is due to the protection of minimum wages, trade unions, and other protectionist institutions. Leuven et. al.'s results, on the other hand, suggest that the relatively lower wage inequality in Europe is due to its lower net supply of low-skilled individuals. Leuven et. al.'s paper thus suggests that it is probably a better policy to reduce the net supply of low-skilled workers, in order to reduce wage inequality.

What has happened to low-skilled jobs?

Looking only at a period of ten years from 1982 to 1992 considerable change has occurred in the distribution of employment between the different sectors of the economies of advanced industrialised countries. The story is by now a familiar one - the older sectors - agriculture, utilities and manufacturing have continued to lose out in employment terms to the service sector. In ten OECD countries, including Germany, Sweden, and France the older sectors - agriculture, and manufacturing - have lost employment to services. Germany has lost just under half a percentage point a year over the ten year period - at the other extreme France and the UK have lost three quarters of a point a year (Robinson 1997)

In the past, these 'traditional' sectors were big employers of unskilled and semi-skilled labour and their decline inevitably means a continuing fall in manufacturing jobs traditionally filled by the low-skilled. But the service sector is also a source of low-skilled jobs and it might be thought that the expansion of the service sector could compensate the low-skilled for the decline of the 'traditional' sectors. However, *within* all sectors - including the declining sectors - managerial and administrative occupations have increased their share of employment. A paper prepared for the project 'Devenir des bas niveaux de qualification: comparaison des situations nationales' (Kirsch 1999a) allows us to examine more closely trends in employment of the ISCED 0-2 group by sector and to make comparisons across countries.

In which sectors is ISCED 0-2 employment concentrated?

The study by Kirsch (1999a) points to the very segmented nature of employment of the ISCED 0-2 group. This can be characterised as a situation of polarisation of skill groups in employment by sector with a group of sectors having a high concentration of the ISCED 0-2 group and a second group having a low concentration. Sectors in which the skill groups can be found in proportions corresponding to their distribution in the population as a whole are much less common. Furthermore, the sectors remain stable over time in their propensity to employ or not to employ the ISCED 0-2 group. It is rare to find sectors moving from one major group to another ie. moving from employing a high proportion of ISCED 0-2 to employing a low proportion or vice versa. The likelihood of employment of ISCED 0-2 in the sectors where they are concentrated is also relatively stable over time, particularly in Portugal and in the Netherlands. In the other three countries there are larger changes in propensity.

In all the countries in our study a number of sectors stand out as sectors where the ISCED 0-2 group is heavily over-represented and which, therefore, offer the best hope of employment for the group. Grouped together these are, essentially, agriculture, certain manufacturing sectors, more specifically clothing and related areas, various extractive and process industries, land-based transport activities and, in the service sector, hotels and catering together with retailing and small repairs. A number of sectors vary between countries in their propensity to employ the ISCED 0-2 group.

What is happening to employment in those sectors?

The study also analyses trends in sectors by total employment size 1985-1997 and also by trends in the employment of the ISCED 0-2 group as a proportion of total employment over time. Five possible sector scenarios are identified:

A. growth in total employment in the sector and growth in ISCED 0-2 employment of the same or higher order of magnitude.

B. growth in total employment in the sector and growth in ISCED 0-2 employment of a lesser order of magnitude.

C. growth in total employment in the sector and a fall in ISCED 0-2 employment

D. a fall in total employment in the sector and a fall in ISCED 0-2 employment of the same or smaller order of magnitude

E. a fall in total employment in the sector and a fall in ISCED 0-2 employment of a larger order of magnitude

For the ISCED 0-2 group the last three scenarios suggest a contraction of employment opportunities. When the sectors which employ a high proportion of the low-skilled are analysed using this framework most are found to have patterns of employment growth which place them in categories C, D and E above. In other words, the majority of sectors in which the ISCED 0-2 group is over-represented and where most of their employment is concentrated have contracted over the period under study. This finding holds for all the countries in our study except for Portugal but in some countries the situation is more critical than in others. For example, in France and Sweden all the agricultural and industrial sectors (16 and 11 respectively) in which the ISCED 0-2 group is over-represented have contracted over the period. In the UK and the Netherlands, the majority of sectors have contracted but a small number have expanded. In services the outlook is less bleak and there is something approaching a balance in terms of expanding and contracting sectors, particularly in the Netherlands and Sweden. It should also be pointed out that some service sectors are expanding rapidly and, even where ISCED 0-2 constitutes a relatively small group their employment nevertheless benefits.

The ISCED 0-2 group on the labour market

The study carried out by CEREQ Kirsch (op.cit.) allows us to view the labour market situation of the low-skilled in relation to their relative supply in the six EU countries included in our study. For example, an indicator of inactivity is constructed as a ratio of the number of low-skilled in inactivity and the number who might be expected to be in inactivity if such a situation were to occur randomly. The resulting coefficient is greater than 1 if the group concerned is over-represented in the category analysed. Using this analysis, Kirsch points to differences between countries in the extent to which the low-skilled are considered employable. The Netherlands is the country in which the low-skilled appear to be heavily discriminated against on the labour market while in Portugal there appears to be little discrimination.

In all countries in the study with the exception of Portugal the ISCED 0-2 group has a considerably higher likelihood of unemployment or inactivity than for the population as a whole. Furthermore, this higher level persists throughout the period of our study (1985-1997). The Netherlands has high rates both of unemployment and inactivity for the ISCED 0-2 group. Sweden has exceptionally high inactivity rates while unemployment for ISCED 0-2 is similar to France, the UK and Sweden. In both the UK and France the likelihood of inactivity is stronger than unemployment, although both are substantial. Portugal is the only country of the five considered where the ISCED 0-2 group has much the same chance of employment, inactivity and unemployment as for the population at large.

Clearly the position of the low-skilled group is an unenviable one in the European Union countries considered here with the possible exception of Portugal. Their relative position and the deterioration that has taken place are all the more dramatic when we consider that the numbers of low-skilled in the labour force are considerably lower in the late 1990s than even ten years ago. The fall in the supply of the low-skilled combined with the fall in their relative earnings and/or employment prospects means that the labour market has moved very decisively against them.

Differences in size of ISCED 0-2 across countries and implications for employment chances

Different countries of the European Union have very different proportions of the population in the ISCED 0-2 category. In the population of working age in Portugal the proportion is just over three quarters (77 per cent) while, at the other extreme, in Sweden, it is just over one quarter (28 per cent). The CEREQ method of calculating propensity to unemployment etc. controls for the proportion of the population in the ISCED 0-2 category in each country. Consequently, the propensity to unemployment and inactivity is not affected by changes in the total size of the ISCED 0-2 group through time, as a raw count of the numbers of ISCED 0-2 individuals in unemployment and inactivity would be. Thus, changes in the propensity of the low-skilled group to suffer unemployment or inactivity over time can be accurately assessed within each country. Note, however, that the propensity coefficients will be sensitive to differences in the size of the ISCED 0-2 group across countries. For example, where the ISCED 0-2 group constitutes three quarters of the labour force, as in Portugal, employers drawing on the national labour market only are necessarily constrained to employ low-skilled labour while in countries where the group is much smaller employers have more degrees of freedom in deciding whether to employ the low-skilled.

It is likely that where the ISCED 0-2 group is small and, therefore, it is assumed, more homogenous in skill composition, as in Sweden, that a stigmatising effect will operate to the disadvantage of those in this group. This effect can be expected to be greater than for the ISCED 0-2 group Portugal and the UK where it comprises half or well over half the population. We might therefore expect two separate factors to operate against the low-skilled group in countries where the ISCED 0-2 group is small. First, it is easier for the group to be marginalised on the labour market because of its small size. Second, the group will be perceived to be more homogeneous with respect to low skills - that is, the likelihood of some of the group having higher level skills will be considered to be lower than in countries where the group is larger[12]. These factors will lower the demand for the low-skilled unless wages fall relative to other skill groups or absolutely in relation to previous years. In all of the EU countries included in the *NEWSKILLS* analysis except for Germany, earnings differentials widened over the period 1980-1995. But in France, the Netherlands and Sweden the change was only slight, whereas in the UK and in Portugal the change was relatively large. A further explanation for the less favourable position of the low-skilled in France, the Netherlands and Sweden might therefore be the lack of wage flexibility compared to Portugal and the UK. The study by Kirsch (1999a)does not attempt to analyse and decompose these effects. Instead, it allows us to analyse, for each country over a 12-year period the position of the ISCED 0-2 group on the labour market relative to trends for the whole population.

The likelihood of unemployment for the ISCED 0-2 group

The likelihood of unemployment for the ISCED 0-2 group was higher in all countries except Portugal in 1997 compared to 1985. However, the extent to which the ISCED 0-2 group was over-represented relative to average unemployment levels varied. For the UK and Sweden the degree of over-representation was similar despite the fact that Sweden has a much smaller proportion of the population in the ISCED 0-2 category. This seems to indicate very different levels of demand for ISCED 0-2 labour in those countries ie a much lower demand for ISCED 0-2 labour in Sweden than in the UK. This observation was supported by evidence from the case-study visits in the two countries. The UK was the only country where employers stated that they would continue to actively recruit individuals at the ISCED 0-2 level. In Sweden, employers were not looking to recruit from this group. Mellander (1998) also throws more light on the Swedish case. He found that the model of firm demand for skills predicted that the greatest fall in demand would be experienced by the ISCED 0-1 group, mostly composed of older individuals with only short compulsory education. Portugal shows that the ISCED 0-2 group is hardly discriminated against at all on the labour market relative to the average. These results are to some extent inevitable because the ISCED 0-2 group constitutes such a large proportion of the total population. Nevertheless, taken together with low levels of unemployment in Portugal relative to other European countries they point to a good level of demand for the ISCED 0-2 group over the period.

---

[12] Evidence from the International Adult Literacy Survey (IALS) does not support this view. Nevertheless, it may still prevail as a perception influencing employers' recruitment behaviour and individuals' motivation to seek work.

The likelihood of inactivity for the ISCED 0-2 group 1985-1997

The likelihood of inactivity for the ISCED 0-2 group was almost twice as high in the UK in 1996 compared to 1985. A steep rise was also registered in France and in the Netherlands. The level in Portugal remained stable. In the UK and Sweden, some stability in the likelihood of unemployment for this group appears to have been achieved at the cost of higher inactivity over the period; this does not appear to be the case for Portugal. For every country except Portugal the likelihood of inactivity increased much faster than the likelihood of unemployment.

Gender differences in unemployment and inactivity

In the UK, the Netherlands and in France men at ISCED 0-2 have a higher likelihood of unemployment or inactivity (relative to all men) than women (relative to all women). In the UK and France the gap has widened between 1985 and 1996 while in the Netherlands it has narrowed. In the UK in 1997 the gap was very large - women in the ISCED 0-2 group had a 16 per cent likelihood of unemployment while men in the group had a 42 per cent likelihood. In Sweden and Portugal the situation was reversed and women had a greater likelihood of unemployment - in the case of Sweden the gap widened slightly between 1985 and 1996. In the case of Portugal the gap remained small and at much the same level over time.

The likelihood of employment for the ISCED 0-2 group

In France, the UK and Sweden the likelihood of employment of the ISCED 0-2 group worsened relative to that of the population as a whole over the period 1985-1996. In the Netherlands and Portugal the likelihood of employment did not vary much over the period.

Age and the likelihood of unemployment or inactivity for ISCED 0-2

In all countries except Portugal the likelihood of unemployment is higher for the young age group (<30 years) compared to the population of working age. In France, the UK and the Netherlands the differences are considerable while in Sweden the difference is small. Between 1985 and 1997 the likelihood of unemployment has increased for the ISCED 0-2 young age group in all countries except Portugal. In the same four countries inactivity rates are also considerably higher for the < 30 age group than for the population of working age except for Portugal where the rate is similar. In France, the Netherlands and the UK the likelihood of inactivity for the < 30 age group at the ISCED 0-2 level is substantially higher in 1997 than in 1985. Sweden shows a fall in the likelihood of inactivity for the young age group as does Portugal.

The quality of new jobs for the low-skilled

We need to look not only at overall earnings and labour market prospects of the low-skilled but also whether other aspects of their employment are changing for better or for worse. Two separate papers on a single theme 'The quality of new jobs/hires in Europe' is now underway as part of the project. Currently results are available for Portugal, the Netherlands and the UK.

The study of the UK, 'Job Quality in the United Kingdom, 1985-1995' (McIntosh 1998a) takes as its starting point the fact that jobs in the UK seems to be changing, as the economy moves from a manufacturing base to a service-sector base. How has this change affected the quality of jobs on offer to British workers? If job quality has changed over the ten years under analysis, have particular groups been affected? As the focus of the *NEWSKILLS* project is on the low-skilled and their position on the labour market, it is of particular interest to examine whether this group have suffered declining job quality.

Job quality is defined along three dimensions. The first measure is the wages that workers receive in their jobs, measured as the real hourly wage rate. Second and third, two indicators were constructed to indicate individuals who are involuntarily in temporary or part-time employment.

It is of interest to examine whether changing job quality, if it exists at all, exists only in the new jobs that are being created, or does it exist in all jobs. To this end, a new job was defined to be less than one year old. The data sets used indicated the respondents' tenure in their current jobs. Thus, a new job was defined as one where the individual had less than twelve months tenure. Note that, by this definition, a new job is not a job that previously did not exist (which would be of interest to examine, but impossible due to lack of data), but merely a new association between an employer and an individual. Thus, the term 'new job match' more accurately describes what is being measured, and will be used below.

This definition makes the measuring of a new job match very easy, although it is not without its problems. The key problem is heterogeneity in workers and jobs. If certain characteristics of jobs are associated with higher quit rates, for example poor working conditions, then new job matches are more likely to possess such characteristics. This does not mean that more jobs with poor working conditions are being created, only that such jobs have higher turnover rates, and so show up in the stock of new jobs more often than in old jobs. Thus changes in relative job quality over time are more interesting than the level of job quality in new job matches, relative to old.

There are two further limitations of the analysis. First, by definition when studying job matches, the unemployed are excluded. Thus, even if job quality is not changing for a particular skill group, their position on the labour market could still be deteriorating due to increased levels of unemployment. Second, again since the unit of observation is a job match, we are observing the outcome of the interaction of demand and supply on the labour market, and we cannot say which has dominated in creating the situations that we observe.

Two large scale surveys provide the data for the analysis, both of which are available annually for all years under analysis (1985-1995 inclusive). The Labour Force Survey was used for the analysis of involuntary temporary and part-time employment, while the General Household Survey provided the data on real hourly wage rates.

The methods used in the analysis were quite straightforward. First, the characteristics associated with being in a new job match were determined, both in cross-tabulation and multivariate analysis form. The characteristics considered were gender, age, education, industry and occupation. In this, and all, analyses, only employees were considered.

Looking first at the incidence of new jobs, new job match rates are revealed to follow a pro-cyclical pattern, rising in the boom years of the late 1980s, when many new job were created, and falling again in the slump years of the early 1990s. 1989 represents a peak year in the period considered, with 21.7% of all job matches being less than 12 months old. The corresponding number in the trough of 1993 is 15.8%. The rate in 1995 is very similar to that in 1985 (18.8% and 18.2% respectively) and since these years are at similar points in the UK business cycle, there is no evidence of any trend rise in the new job match rate.

The pro-cyclical pattern with little trend increase is repeated for most categories of the explanatory variables. Comparing levels, females have a higher new job match rate than males, the middle ISCED groups have a higher rate than the high or low ISCED groups, and the young have a higher rate than the old, although the differences are narrowing over time. There is some evidence of a secular rise in the new job match rate amongst the under 24s, presumably due to longer participation in formal education, and so later introductions to first jobs. With respect to industry, higher new job match rates are found amongst service industries such as catering, wholesale/retail trade and other services. In 1995, over 1 in 5 of all new job matches were in the wholesale and retail trade sector. Lower new job match rates are observed in white-collar industries such as finance, public administration, education and health, as well as in the public utilities industries. In terms of occupations, a similar pattern emerges, with the highest rate of new job matches being amongst those in sales occupations, followed by personal services, and other elementary occupations. The workers with the lowest new job match rate is corporate managers, followed by all of the professional and associate professional occupational groupings, although note that health professionals have a relatively high rate.

The multivariate equations reflect closely the results of the cross-tabulations just described. The one exception is that, holding other things constant, it is now the low-skilled (ISCED 0/1) who are the most likely to be in a new job match, whereas previously in the raw data it was the middle ISCED groups. It is likely that individuals in the latter groups are, on average, younger than those in the lowest ISCED group, and so had higher new job match rates in the raw data for that reason.

The study also examined real hourly wage rates. Looking first at the raw data, wages are higher in old job matches than in new, as expected since wages typically rise with tenure. The difference between the two fluctuates over the ten year period under consideration, so that no real trend in the quality of new job matches, relative to old, can be found along this dimension.

The multivariate analysis, controlling for gender, age and education, reveals a similar picture. In both the old job match and the new job match equation, we see rising real wages in both job types in the 1980s and stagnating real wages in the 1990s. There has been little change in the *relative* quality of new job matches over the ten year period.

Examining each skill group in turn, the familiar pattern of rising real wages in the late 1980s, and stagnating real wages in the early 1990s, is found in old job matches for each skill group. The percentage rise in wages over the period is greatest for the most highly skilled, but is very similar for the other three groups. The well-documented rise in wage inequality in the UK therefore seems to be caused by an increase in wages at the top end of the income distribution. For new job matches, there are some interesting differences across skill groups. While the usual pattern of rising, then stagnating real wages is observed for the two lowest skill groups, for the ISCED3 group, real wages in the 1990s fall back to a level insignificantly different from their 1985 level in new job matches. Perhaps the higher demand for and supply of individuals with degrees has harmed the labour market position of those who have A levels as their highest qualification. Finally, for the high ISCED group, there is some evidence that real wage rates in new job matches have continued to rise even in the 1990s. Despite these differences, the pooled equations across all jobs suggest that there has been no shift in the relative quality of new job matches along this dimension, for any skill group. One exception is a negative coefficient on the 1995 new job match interaction for the ISCED 3 group, who have seen a relative decline in the quality of new jobs being created for them.

One criterion used to judge job quality was involuntary temporary employment, that is, whether an individual had a fixed term contract as opposed to an open-ended contract but would have preferred an open-ended contract. As expected, the rate of involuntary temporary employment is several times higher in new job matches than in old. The crucial issue, however, is how this rate has changed over time.

In old job matches, the rate was constant at a low level throughout the second half of the 1980s, then began to increase in the 1990s, to stand at 1.5% by 1995. In new job matches, a counter-cyclical pattern appears to be in evidence, with the rate of involuntary temporary employment falling in the boom years of the late 1980s, and rising again in the first half of the 1990s. There is slight evidence of a small trend rise in involuntary temporary employment in new job matches over the ten year period, particularly for women. In relative terms, the overall increase in the rate of involuntary temporary employment over the period is slightly larger in new job matches than in old, providing again slight evidence of a relative decline in the quality of new job matches along this dimension.

These cross-tabulation results are again supported by the multivariate results. In old job matches, there is little statistically significant variation in the rate of involuntary temporary employment during the 1980s, but then there is a significant rise in the 1990s. In new job matches the rate follows a counter-cyclical pattern, falling in the late 1980s, then rising again in the early 1990s. There is a small trend increase in the rate of involuntary temporary employment, over the full ten year period. In a pooled equation across old and new job matches there is evidence that, holding demographic factors constant, the *relative* quality of new job matches has increased along this dimension over time. Thus the increase in involuntary temporary employment in new job matches has been lower than that in old job matches.

The control variables in the estimated equations suggest that women and the young are more likely to suffer involuntary temporary employment in old job matches, but males and older workers have the higher rates when it comes to new job matches. With respect to education, those at the lowest and at the highest level have significantly higher rates of involuntary temporary employment than those at ISCED level 2.

Repeating these equations for each ISCED group in turn reveals that in old job matches, the pattern of low, constant rates of involuntary temporary employment in the late 1980s, followed by an increase in the early 1990s, is repeated for each skill group. Similarly, the fall in this rate in new job matches in the late 1980s observed above is replicated at each skill level. Differences occur in the 1990s, however. Whereas in the full sample, a large increase in involuntary temporary employment was observed in this decade, this is not the case for the unskilled, whose rate in the 1990s is insignificantly different from that in 1985. The group who see the largest rise in such employment in new job matches in the 1990s are the most highly skilled, followed to a lesser extent by the middle skill groups. Thus, the relative increase in the quality of new job matches is observed most strongly for the unskilled, and is not observed at all for those employees who hold degrees.

The second criterion used to assess job quality was involuntary part-time employment i.e. an individual works part-time but would have preferred a full-time position. The results for the rate of involuntary part-time employment in the raw data are similar to those for involuntary temporary employment observed above. Thus, in old jobs, the rate is low and fairly constant in old job matches in the late 1980s, with a slight dip in 1989 and 1990, but then begins to rise strongly in the early 1990s. In new job matches, which have a higher rate than old job matches, the rate falls during the boom years of the late 1980s, and rises again in the slump years of the early 1990s, to finish the period in 1995 at a higher level than it began in 1985.

The results of the multivariate analysis again confirm the trends observed in the raw data. They indicate that the gap between the rates of involuntary part-time employment in old and new job matches has fallen over time, thus again suggesting a *relative* increase in the quality of new jobs.

The results for the demographic characteristics show that there is a strong inverse correlation between skill level and incidence of involuntary part-time employment. The unskilled are thus far more likely to suffer such employment. Women and older workers are also more likely to be involuntarily in part-time employment.

Differentiating by skill level, in old job matches the pattern of results is very similar for each subsample as it is for the full sample. The fall in the rate of involuntary part-time employment in new job matches in the late 1980s is also replicated at each skill level, although it does not occur until 1989 for the most highly skilled, and is less dramatic. The subsequent rise in the rate in the 1990s is felt by all skill groups, although the increase is lowest for those at the unskilled level. The interactions between new job match status and the year dummies reveal that the only group who do not enjoy a rise in the relative quality of new job matches over the ten year period are the highly skilled, for whom every interaction coefficient is statistically insignificant.

The preceding analysis suggests that there does not seem to have been a relative decline in the quality of new job matches. Job quality in terms of the rates of involuntary temporary and part-time employment has declined throughout the period, but the decline has been larger in old job matches than in new, suggesting a rise in the quality of new job matches relative to old. Rising rates of unsatisfactory employment positions are therefore not the exclusive domain of newly created, low tenure jobs, but are becoming more pervasive throughout the economy.

With respect to skill level, the low-skilled are at a disadvantage in terms of wage rates and involuntary part-time employment rates, although not in terms of the rate of involuntary temporary employment. This disadvantage does not seem to have escalated over the ten year period in question, however, with declining job quality hitting all skill groups. Indeed, the increase in the *relative* quality of new jobs is least visible for the more highly skilled. So while it becomes more difficult for the unskilled to acquire work in the modern economy, the position for those who do, does not seem to have declined further, relative to their more highly skilled counterparts.

The study of new job quality in Portugal and the Netherlands is described in 'The Quality of New Jobs for the Low-Skilled in Europe' (Leuven and Oosterbeek 1998b). For Portugal and the Netherlands measures of job complexity and wages are available to assess the quality of new jobs/hires

Results for Portugal (1982, 1986 and 1992) show that in this country there has been a sharp increase in the quality of new jobs. For the Netherlands, using biannual data from 1986 to 1996, we find that the absolute quality of new jobs has not changed much over this period. There is, however, a tendency for the relative quality of new jobs to fall. This happened after 1992 and is due to an increase in the quality of old jobs. These developments have been disaggregated by level of education; the results show that in both countries the same tendencies hold for lower educated workers as well.

Recent trends in the employment of young people without upper secondary education

A study carried out in association with the *NEWSKILLS* project entitled 'Low-skilled young people on the labour market in Sweden from the 1970s to the 1990s' provides further insight into changes in labour market prospects that have occurred over time for young people in the least-educated group in Sweden (Murray 1999). The aim of the study is to investigate changes on the labour market from the 1970s to the 1990s for young men and women without further education and training. They have been compared to young men and women with a 2-year vocational upper secondary education from three male dominated and three female dominated programmes.

Three nation-wide follow-up studies of school leavers from compulsory school form the basis of the study. The first took place in 1978, the second in 1986 and the third in 1995. Nationally representative samples of school leavers (13 000, 14 000 and 16 000 respectively) were investigated at the age of 22-23 by Statistics Sweden.

The results indicate both long term structural changes and short term changes as a result of the economic recession in the 1990s. Some changes were found already in the 1980s and others in the 1990s.

The effects of structural changes were found among the young men without further education and training as their employment rates decreased systematically both in the 1980s and in the 1990s. In contrast the employment rates for men with a vocational training only started to decrease in the 1990s.

The effects of structural changes were also found among women without further education and training, as differences in employment rates between these women and women with vocational training widened already in the 1980s and even more in the 1990s. Both men and women without further education and training also had to find jobs in different occupational sectors, compared to the 1970s.

Structural changes on the labour market were also found to affect men and women with a vocational training. First, employment in the sector they were trained for decreased. Second, the wage premium for having vocational training that was found in the 1970s between men and women *with* and *without* vocational training was beginning to fall in the 1980s and had almost disappeared in the 1990s.

However, the greatest change for men with a vocational training occurred at first in the 1990s when employment rates decreased to the same extent or more than for men without further education and training. For women with a vocational training employment also decreased but not to the same extent as for the women without a vocational training.

The results do not give a simple picture of the significance of a vocational upper secondary education on the labour market. In the 1990s it made hardly any difference to chances of unemployment or a better paid job, but it still meant access to more skilled jobs than the jobs found by young men without further education and training. For the women a vocational upper secondary education meant access to more qualified jobs, better employment opportunities and for some a better paid job.

The results indicate that not only education and training, but also other factors are of importance for young men and women on the labour market. One of these is the business cycle and the demand for labour. Employment rates decreased in all investigated groups in the 1990s. Institutional factors may also have an impact on the demand for young workers. The introduction of 'youth jobs' (publicly subsidised jobs for young people) for 16-17-year olds in 1976 and for 18-19-year olds in 1984 have reduced unemployment among 16-19 year olds in the 1980s but also replaced jobs for young people on the open labour market. The introduction of 'youth jobs' in 1992 for young adults (18-24-year olds) has probably also substituted for jobs for young adults on the open labour market.

Another factor of importance is the vocational programme and how it matches the demand for labour. In the 1990s the demand for building workers was very low. Although schools do react to changes in demand, this is a rather slow process and sudden changes in demand are therefore not easy to deal with for schools. Structural changes are more easy to adapt to as they can be planned for by the school authorities. The best steering instrument is probably the applications from the students to the different programmes. They are often sensitive to changes in demand for labour. The consistently lower employment rates and wages for women than for men also show that young women - especially the least-educated - have been the worst hit by labour-market changes in the 1990s. This finding is supported by the results for Sweden reported by Kirsch (*op.cit.*).

A further study summarised here (Murray 1997) was carried out in association with the *NEWSKILLS* programme and aims to describe the home and school background of young people without an upper secondary education and identify factors which have an impact on their labour market position. This study provided insight into factors affecting the employability of the least-educated group.

In the context of the expansion of upper secondary education in Sweden, young people without an upper secondary education might be considered an at-risk group on the labour market. This is partly because the labour market for young people has become more limited since the 1970s, and partly because young people without further education and training have become a smaller minority and are therefore in danger of stigmatisation. In the middle of the 1980s most school leavers (91 per cent) from compulsory education continued to upper secondary school but 4 years later about 20 per cent of the cohort lacked an upper secondary education. Nine per cent had dropped out of upper secondary school and 4 per cent had only attended one-year courses or less of further education and training.

The study is a part of a school research project in which a national sample of pupils (9000) has been followed from the age of 13 through their school years. Employment data for school leavers without an upper secondary education were collected via a questionnaire sent to them when they were 23-24 years old. Logit models were used to identify factors which have an impact on whether young people had been unemployed or not from age 20 to 24.

The results show that the dominant pattern among young people without an upper secondary education was a blue-collar home background, extensive special education, low self-esteem and low and declining teacher marks. A similar pattern also characterised young people with a two-year vocational upper secondary education. However, their self-esteem and their teacher marks were not quite as low as for those who left school at the age of 16.

Although the majority of young people without further education and training had great difficulties in school they never experienced real unemployment but entered the open labour market no later than at age 20. The context of this finding was the long economic boom of the 1980s. Eligibility for youth labour market programmes ended at the age of 20 for the cohort investigated. During the period from age 20 to 23 they were on the open labour market. However, 21 per cent of the men and 32 per cent of the women had experienced unemployment at least once during this period.

Father's occupational status showed a significant correlation with the occurrence of unemployment among the young men. Sons of unskilled workers had a greater likelihood of experiencing unemployment than sons of skilled workers. Controlling for father's socio-economic status, neither family composition (one- or two-parent families) nor school achievement had any significant effect on whether they had been unemployed or not.

Fathers' socio-economic status was not significantly related to the occurrence of unemployment among the women. But women who had grown up in one-parent families (usually single mother) had a higher likelihood of experiencing unemployment than women who had grown up in two-parent families. Early aspirations also seem to have an impact as women who had chosen a less academic study programme at the age of 13 also had greater likelihood of experiencing unemployment than those women who had chosen a more academic study programme.

Controlling for these factors only teacher marks in physical education (sports) had an impact on occurrence of unemployment among the women. Thus, unemployment among young people without further education and training was associated with their home background. Controlling for home background, school achievement had hardly any impact on whether they had been unemployed or not.

We know from all the work in this area that, although the least-educated are more likely to be unemployed than the more-educated, most least-educated individuals are in employment at any one moment in time. This study of Sweden suggests that factors associated with upbringing and family circumstances - possibly improved social skills or better access to labour-market information - improve the employment chances of the low-skilled.

4. CONCLUSIONS AND POLICY IMPLICATIONS

C.1 The labour market situation of the ISCED 0-2 group has deteriorated

Our work shows that over the period 1985-1996/7, in all our countries except for Portugal, the proportion of ISCED 0-2 in employment relative to the average for all skill levels either did not fall or fell only slightly [8]. In effect, this means that around half the low skill group continued to be excluded from employment over this period. However, unemployment and inactivity rates of ISCED 0-2 relative to the average for all skill levels increased in four out of our five countries (France, Netherlands, Sweden and the UK). In other words, the likelihood of unemployment or inactivity increased for the low skill group relative to all skill levels over the period. The rapid decline in the proportions of the ISCED 0-2 group in the population in all countries helped to prevent an even sharper increase in unemployment and/or wage differentials than that found in the 1970s and early 1980s. Nevertheless, the conclusion must be that, except for Portugal, the supply of individuals at ISCED 0-2 continues to run ahead of demand at current labour costs.

C.2 ISCED 0-2 will continue to be in demand, but only in some sectors of the economy

We do not find any reason to suppose that there will be no demand in future for individuals with ISCED 2 even at current labour costs. The demand for this group will vary from country to country as is clearly revealed in the case study visits. In Portugal, demand remains high, in the Netherlands case study firms are equally split between those who will hire at ISCED 3 and those who will hire at a lower level. In Sweden most firms will only hire ISCED 3 individuals but it should be recalled that Sweden has a very low proportion of the population in the ISCED 0-2 group. In the UK case study firms, both the manufacturing employer and the hospitality and catering employer interviewed intended to continue recruiting at this level [3].

C.3 Most sectors employing the ISCED 0-2 group are unlikely to be expanding

However, while the outlook for the continually decreasing ISCED 0-2 groups is not entirely bleak there is little evidence either from our study of manufacturing in Sweden [20] or our analysis of employment trends by sector [8] that demand for ISCED 0-2 groups will rise in future. Our case studies [3] show that, in certain sectors demand for individuals with ISCED 0-2 has remained relatively stable. However, these are, for the most part sectors where total employment has fallen or failed to expand over the period of our study.

C.4 Young people should aspire to at least ISCED 3 level education

Our study of manufacturing in Sweden shows that technical change skills bias reduces the demand for all but the most highly-educated ie university level workers [20]. Add to this the evidence that the higher ISCED groups are more likely to be willing and able to take advantage of offers of further training and the clear implication is that ISCED 3 should be the level to which most or even all *young people* should be encouraged to aspire. This is the level of skill regarded by many experts in the area as the minimum required for coping with the demands of the modern workplace and modern society (OECD 1997b). Currently, all indications are that demand for university-level skills will remain high and all who wish to continue beyond Level 3 should be encouraged to do so - although not necessarily in full-time study or before acquiring initial labour market experience.

C.5 Problems created by reducing the low-skilled group

There seems to be a good case for continuing to encourage as many young people as possible to attain an ISCED 3 type qualification before entering the labour market as a full-time employee. But we must also recognise that it will be some decades before this is achieved. At the same time, there are indications from our work that the more the ISCED 0-2 group is reduced the more those remaining in it are discriminated against on the labour market. Action to reduce this group further needs to be carried out in such a way as to minimise this problem.

C.6 Certification for the ISCED 0-2 group should demonstrate the full range of their skills

We know from the IALS survey that the ISCED 0-2 group is more heterogeneous than any other group and this holds even when the ISCED 0-2 group is relatively small [24]. Yet employers increasingly act as if the group were homogeneous, ie all at a low level. This means that the ISCED 0-2 group is badly served by current policies of extending national academic qualifications structures so as to encompass the whole ability range. We support the view that all those who leave education and training should be guaranteed a minimum level of literacy and other essential tools for personal development (see our Recommendations below).However, young people with low level academic qualifications could be offered a period of work experience as an extension of their school experience. Academic certificates could then be supplemented by employer references based on their work experience. These would provide reliable evidence of personal qualities and abilities. In this way, the individual differences between those in the ISCED 0-2 group could be more adequately signalled and communicated.

C.7 Communication and social skills are an important 'skill shortage'

We know from our case studies [3] that employers of ISCED 0-2 individuals place a high premium on appropriate attitudes and social skills, including communication. These can be fostered and developed by suitable programmes and should be accorded more emphasis in preparing young people in the ISCED 0-2 group for employment. Similar priority needs to be given to strategies to equip individuals at ISCED 0-2 already in the labour market with such skills since our case-study evidence indicates that employers are currently rejecting individuals because they lack such skills and/or investing heavily in developing 'soft' skills in their employees. The Netherlands is reporting an increasing degree of mismatch between the expectations employers have of the qualities needed if the ISCED 0-2 group is to be offered employment, and the qualities offered. Thus we have the paradox of high levels of unemployment and inactivity among the ISCED 0-2 group in the Netherlands combined with reported shortages of such individuals from employers. In the UK the manufacturing producer interviewed also wished to recruit from this group but was finding that many of those who applied lacked the right 'attitude' and/or social skills.

C.8 Incentives for the low-skilled to participate in workplace training are insufficient

We have found that ISCED 0-2 individuals in employment are coping with more work-place complexity than ten years ago [12]. However, our work also demonstrates that, overall, older individuals receive less workplace training than the young and that the poorly-qualified receive less training than the more highly-qualified [19]. At the same time, one study also show that firms get an extremely high return on investment in work-place training [6]. One explanation of these apparently contradictory findings is provided in our research. This suggests that, while training provided by employers in the workplace is a valuable source of additional skills for ISCED 0-2 individuals, this same group is more reluctant to take up offers of employer-provided training than other skill groups [10,14]. This underlines the importance of putting in place the right incentives and support to encourage learning to the minimum platform and beyond for those already in the labour market. We therefore see signs that incentives for the low-skilled in employment to participate in training are not sufficient to ensure an optimal supply. A study-time entitlement following the compulsory schooling period without rigid time or age constraint could help to bring about a shift from a teaching supply paradigm to a learning demand paradigm. In this context it will be useful to observe the performance of the system of Individual Learning Accounts recently introduced in the UK.

C. 9 Wage subsidies for older low-skilled individuals may help counteract exclusion

The evidence from our research indicated that the ISCED 0-1 group is particularly threatened by technical change. With the exception of Portugal (already noted) for ISCED 0-1 workers the skill bias in technical change is so strongly demand-reducing that it is doubtful whether it can be countered by skill up-grading. It has been suggested above that, where this group is above the average workforce age, wage subsidies might be a more efficient way of counteracting labour market exclusion [20]. The problem of providing perverse incentives to individuals to remain low-skilled by providing subsidies for low-skilled individuals would be overcome if these subsidies were only available with respect to older workers who would soon reach retirement age. Marginal wage reductions on workers with ISCED 0-1 education will be effective in the sense that the increased demand for these workers is not off-set by reductions in the demand for ISCED 2 workers.

The minimum learning platform

The views of the Social Partners

From the meeting organised and hosted by CEDEFOP in October 1998 a number of important conclusions emerged in relation to the minimum platform and measures which would be required to achieve it [1].

Participants from all the constituencies represented at the meeting expressed support for the concept of a minimum learning platform but stressed the desirability of individual European countries moving towards defining the content and delivery that they considered appropriate.

Dissatisfaction with the outcomes of the formal education system for the minority of low achievers or 'marginalised' young school leavers constituted an important reason why support for the concept of a minimum platform was widespread.

Dissatisfaction centred around two main concerns. The first was a concern with the difficulty of including in the curriculum of the school the core personal and social skills that many considered indispensable for employment and the capacity for lifelong learning.

The need for a new balance between formalised knowledge and personal and social skills was emphasised. The concept of 'basic skills' itself requires revision so as to incorporate the 'higher order' basic skills of problem-solving and self-directed learning that are becoming necessary for all citizens in Europe.

The second concern that emerged was that achievement after nine or more years of schooling continues to be immensely variable with a minority failing to achieve a viable level. It was felt that an outcomes-based definition of goals might be a way of ensuring that a minimum threshold was attained by many more than at present.

However, the outcomes-based model raises problems of assessment and measurement of attainment which will need to be addressed. This is a particular problem with the newer 'soft' personal and social skills which cannot easily be assessed by conventional means and with outcomes defined in terms of practical competences.

The necessity of considering alternative ways of delivering the minimum learning platform was also stressed. That is, the processes which will enable individual learners, young people and adults alike, to attain the level of the minimum platform, require innovative thought and action.

There was a widespread view that the workplace would have to play a much more central role than in the past in delivering some elements of the minimum platform. This in turn would require the creation of a new Social Partnership to develop and use the resources of the workplace for learning and individual development.

Such a development also raises the question of how costs of enabling young people and adults to attain the minimum learning platform should be shared. Inevitably there will be resource implications since costs for the minority of those who have difficulty with basic skills will be high. It may be necessary to rethink the current basis for distributing educational resources which results in those needing the most education frequently receiving far less than their fair share of total resources.

It was concluded that it would be desirable to move away from the current pattern in Europe of universal entitlement to the same number of years of education without definition of a minimum acceptable outcome. Instead, entitlement would be to years of education *and* to achievement of the minimum platform, although most would progress beyond that point.

The idea of having a single minimum learning platform across all of Europe was also discussed. Although it was recognised that the needs of individuals should form part of the content of the platform, the needs of employers are very important, and as these differ according to the varying labour market conditions across different European countries, the platform may have to be set at a different level in different countries.

We should also acknowledge that the platform is not fixed, but will change over time. What are not essential skills for today's labour market may one day be indispensable, and hence part of any minimum learning platform.

Policy Implications

From the work of the *NEWSKILLS* group we conclude that the labour market situation of the low-skilled in Europe remains difficult with high levels of exclusion. The trend towards increased exclusion has continued into the 1990s and we see no indication that the situation will be reversed in the coming decade. Indeed, the latest indications are that it may be again be accelerating.

Improvements in the education and training levels of young people have not prevented a worsening of the situation for the low-skilled. Even at present growth rates, in most European countries at least 20 per cent of the population will continue to fall into this category well into the next millennium. As a consequence, the employment prospects of the low-skilled and associated social inequality will continue to pose a major problem for Europe over the coming decade.

The findings of our programme of research inevitably point to a number of policy failures. These were emphasised further at the meeting with the social partners.

The first major policy failure that needs to be addressed is that schools in all European countries are continuing to produce young people inadequately equipped or prepared to take advantage of further education and training.

What is worse, some of those who leave initial education have developed an aversion to learning as a result of their school experiences and the disastrous results of this are seen in the reluctance to 'go back to school' to acquire further education and training in later life.

The period of basic (usually compulsory) education should not be primarily concerned with selection for higher levels of education. Schools need to focus more on ensuring a minimum level for all and on maintaining high levels of self-esteem during the period of compulsory education

An equally serious policy failure has occurred at the level of education and training for mature adults. Few older people have improved their qualifications. Most improvement in the qualifications of the labour force have occurred as a result of the entrance of better-qualified young people. The formal adult education system fails, because it replicates the school system and is not appealing to low-skilled individuals already in employment. We therefore must not just provide training, but also address the low demand for training - supply does not create its own demand.

As emphasised in the main body of our report, there are substantial differences between European countries in the size of the low-skilled group in the population, its age composition and degree of variability of attainment within the group. From this we conclude that there can be no 'one size fits all' recommendation as to the specification of a minimum platform or as to its implementation.

Countries differ in the degree to which they have tackled prevention and remediation. For example Sweden has good policies in the area of prevention but does not do so well on remediation. In France the reverse is the case. We therefore conclude that we need a set of policies that are flexible enough to enable the different European countries to produce policies 'tailor-made' to address their own set of problems and challenges.

For that reason, we do not seek to set out a simple 'blueprint' for a minimum platform for Europe. Instead, we point to the policy failures that must be addressed and identify weaknesses in current incentive structures that need to be rectified. We then indicate the features that a minimum learning platform policy should incorporate and the strategies that need to be considered for the policy to be effective.

A minimum platform should not just be concerned with the set of skills currently defined as 'employability'. Roberto Carneiro in a paper contributed to the Agora IV seminar [1] considers that 'A minimum learning platform is not a simple technical target..... It deals with all aspects of the human condition... A minimum learning platform is that threshold level - translated into knowledge and basic understanding of humankind - that allows for a personal quest for meaning'.[13] Furthermore, a minimum platform should be informed by the set of values that individuals in all countries share by virtue of their European citizenship, in particular respect for human rights, the rule of law and democratic decision-making.

Policy also needs to take account of the current state of transition of European societies from an industrial mode of production to a knowledge-based society with the new skill requirements and new learning and information infrastructures that accompany that transition. Our case studies in companies [3] have yielded much evidence that failure to develop certain personal qualities and social skills can be barriers to employment as well as handicaps in everyday life.

Finally, a minimum learning platform should be inclusive, ie open to all. This is perhaps the area where policy needs to be most radically rethought since the traditional approach to education has been characterised in a number of countries by successive exclusion at different stages of education and selectivity based on performance.

Policies need to ensure a learning entitlement for all citizens which will make access to a minimum platform a realistic possibility regardless of conventional institutional constraints. This means that learning must be provided and supported not only during the early years of life but throughout life; it must not only be available in 'school' settings but outside the conventional settings, for example in the workplace, the home and the shopping centre.

Learning must be facilitated not just by the traditional teacher-pupil relationship but using the potential of new information and presentation technologies. Using these technologies the tyranny of time and distance can be overcome and more attractive and flexible learning opportunities provided. The potential of private initiatives and enterprise to respond to learning needs should be liberated. Firms and schools or other learning providers acting in concert or in co-operative ventures could help to provide a curriculum which promotes more and better learning for the disaffected.

Finally, the new learning structures and incentives outlined above should then form the basis for a permanent paradigm shift to a new social contract where the *right* to education is complemented by a *new civic and social obligation* to undertake learning and self-development throughout life.

---

[13] This section of the report owes a great deal to the paper contributed to the Agora IV Seminar Carneiro R 'Achieving a Minimum Learning Platform for All - Critical Queries Influencing Strategies and Policy Options'

ISSEMINATION AND/OR EXPLOITATION OF ESULTS

entre for Economic erformance, London chool of Economics, ondon		Presented At seminar/ conference	Can be downloaded From web page	Submitted for Journal/other publication	Accepted for Journal/other publication
r. Hilary Steedman	Steedman H (1999) 'Looking into the Qualifications Black Box: What can International Surveys tell us about Basic Competence'. Discussion Paper No. 431 Centre for Economic Performance, London School of Economics and Political Science [24]	✓	✓		
	Steedman H (1999) 'Low Skills: How the Supply is Changing across Europe' in European Trends in Occupations and Qualifications, CEDEFOP, Luxembourg [25]	✓	✓		✓
r. Steve McIntosh	McIntosh S (1998b) 'The Demand for Post-Compulsory Education in Four European Countries' Centre for Economic Performance Discussion Paper No. 393, May [17]	✓	✓		✓
	McIntosh S (1998a) 'Job quality in the United Kingdom, 1985-1995' Working Paper No. 981, Centre for Economic Performance, London School of Economics and Political Science [18]	✓	✓		
	McIntosh S (1999) 'A Cross-Country Comparison of the Determinants of Vocational Training' Centre for Economic Performance Discussion Paper No. 432, July [19]	✓	✓		✓

Centro de Estudos dos Povos e Culturas de Expressao Portuguesa, Universidade Catolica Portuguesa					
Professor Roberto CARNEIRO	Carneiro R and Conceiçào P (1999) 'Learning-by-Doing and Formalized Learning: A Case Study of Contrasting Development Patterns in Portuguese Industry' Working Paper 1009, Centre for Economic Performance, London School of Economics [2]	✓	✓	✓	
	Carneiro R ACHIEVING A MINIMUM LEARNING PLATFORM FOR ALL - Critical queries influencing strategies and policy options Article in [1]	✓	✓		✓
Dr Mario Ferreira LAGES	Lages M (1997) 'The Output of the School System in Portugal: Facts, Figures and Issues' Mimeo, CEPCEP, Catholic University of Portugal, Lisbon [15] Lages M (1998) 'Some Questions on the Differential Success of Portuguese Students' Mimeo, CEPCEP, Catholic University of Portugal, Lisbon [16]				
Max Goote Centre					
Professor Willem HOUTKOOP	Houtkoop W (1999) 'The Position of the Low-Skilled in Firms' Max Goote Centre, University of Amsterdam, mimeo [3] Houtkoop W (1999) Progress towards the minimum learning platform [26]				

BEST COPY AVAILABLE

Faculty of Economics, University of Amsterdam					
Dr Hessel OOSTERBEEK					
Dr Edwin LEUVEN	Leuven E and Oosterbeek H (1997) 'Demand and supply of work-related training: Evidence from four countries', Tinbergen Institute Discussion Papers 97-013/3 [10]	✓	✓		✓
	Leuven E, Oosterbeek H, and van Ophem H (1998a) 'Explaining International Differences in Male Wage Inequality by Differences in Demand and Supply of Skill' Centre for Economic Performance Discussion Paper No. 392, May [11]	✓	✓	✓	
	Leuven E and Oosterbeek H (1998b) 'The Quality of New Jobs for the Low-Skilled in Europe' mimeo, Faculty of Economics, University of Amsterdam [12]				
	Leuven E and Oosterbeek H (1998c) 'An Explicit Sharing Rule for Firm-specific Human Capital Investments' mimeo, Faculty of Economics, University of Amsterdam [13]				
	Leuven E and Oosterbeek H (1999) 'Demand and supply of work-related training: Evidence from five countries (Results for the United Kingdom)' Mimeo [14]				

BEST COPY AVAILABLE

Stockholm Institute of Education					
Dr Asa MURRAY	Murray A and Steedman H (1999) 'Growing Skills in Europe: the Changing Skill Profiles of France, Germany, the Netherlands, Portugal, Sweden and the UK' Centre for Economic Performance Discussion Paper No. 399, (Revised December 1999) [21]	✓	✓	✓	
	Murray A (1997) 'Young People without an Upper Secondary Education in Sweden. Their home background, school and labour market experiences' *Scandinavian Journal of Educational Research*, Vol. 41, No. 2, [22]	✓			✓
	Murray A (1999) 'Low-skilled Young People on the Labour Market in Sweden from the 1970s to the 1990s mimeo Stockholm Institute of Education; accepted for publication as 'Changes on the Labour Market for Young Adults without Further Education and Training' in the *Journal of Education and Work* (forthcoming) [23]	✓			✓
ndustriens Utredningsinstitut					
Dr Erik MELLANDER	Mellander (1999) 'The Multi-Dimensional Demand for Labour and Skill-Biased Technical Change' Mimeo, Industriens Utredningsinstitut, Stockholm [20]	✓	✓		

BEST COPY AVAILABLE

Dr. Eugenia Kazamaki OTTERSTEN	Kazamaki Ottersten E (1997) 'Labour Demand: An Institutional Approach' Mimeo, The Research Institute of Industrial Economics, Stockholm [4]				
	Kazamaki Ottersten E (1998) 'Labour Market Conditions, Wage Bargaining and Education Policies: A Note' Mimeo, The Research Institute of Industrial Economics, Stockholm [5] (to follow)				
	Kazamaki Ottersten E, Lindh T and Mellander E (1999) 'Evaluating Firm Training, Effects on Performance and Labour Demand' *Applied Economic Letters*, 6, 431-437 [6]				✓
CEREQ					
Mr. Jean-Louis KIRSCH	Kirsch (1998) "Low Training Levels on European Labour Markets : Convergence and Contrasts", *Training and Employment* n° 34, Céreq, Marseille [7]		✓		✓
	Kirsch (1999a) 'Devenir des bas niveaux de qualification: comparaison des situations nationales' mimeo CEREQ, Marseille [8				
	Kirsch (1999b) "Niveau de formation et marché du travail : l'Europe des contrastes", Bref n° 151, Céreq, Marseille [9]		✓		✓

Strategy for dissemination adopted during the lifetime of the project

During the life-time of the project, project members took every opportunity of promoting and summarising our research in a variety of meetings and conferences at national and European level. Particular efforts were made to disseminate our work through publications and events organised by CEDEFOP (see under Publications [1] and [25]) and Appendix 3 *passim*.

Since our last meeting planning is now taking place, led by the NEWSKILLS co-ordinator at the LSE for an application for funding for 'accompanying measures'. It is hoped that this funding will enable us to plan, together with other related TSER projects, a high-level seminar addressed to European policy makers which will contribute

BEST COPY AVAILABLE

to the formulation of policy on the minimum learning platform. LSE plans an article in the widely-read CEP magazine *CentrePiece* together with a presentation to an group of business and trade-union leaders associated with the CEP. The results of the project as summarised in the Executive Summary have been requested by government officials preparing a report of the government's Skills Task Force.

In addition, individual project partners report the following:
IUI: Stockholm (Erik Mellander)

Regarding my paper (Mellander (1999) 'The Multi-Dimensional Demand for Labour and Skill-Biased Technical Change' Mimeo, Industriens Utredningsinstitut, Stockholm [20]) it is now available as a Centre for Economic Performance Discussion Paper, No 440. [It is also available as IUI Working Paper No 518 and as Working Paper 1999:9 at the Office of Labour Market Policy Evaluation (IFAU)].

I also have a Swedish paperbased on the same analysis as well. It is entitled "Varför har efterfrågan fallit på lågutbildad arbetskraft i svensk tillverkningsindustri?" (What Lies behind the Fall in the Demand for Low-Skilled Labor in Swedish Manufacturing?) and is available as IFAU Forskningsrapport (Research Report) No 1999:8.

Both of these papers are much too long, which is why I have not yet submitted them for publication. I have, however, submitted the English version for presentation at the joint "World Conference of EALE (the European Association of Labour Economists) and SOLE (the Society of Labor Economists)" in Milano, June 2000, and at the "Eighth World Congress of the Econometric Society" in Seattle, August 2000.

Regarding further work, Erika Ekstrom and I are still planning to extend the analysis of Mellander (1999) to France. Now that Erika Ekstrom is going to move to the IFAU, where I work part-time, I think the opportunities will increase.

Stockholm Institute of Education (Asa Murray) The content of the article "Changes on the labor market" have been the content of my lecture on "Researchers' day" in October last year when the researchers of the Institute present their research for all freshmen at the institute. I have also presented the results for the personnel at my department and I will also present them in a lecture for 90 students in special education.

I have done new analyses of the data from 1995, a regression analyses showing the impact of an upper secondary education on unemployment controlling for some background factors. However, I have not written up the results yet but I intend to present the results on the ECER-conference in Edinburgh.

Erika Ekstrom and I have got a research grant for further work on young people and upper secondary education and we will include young people without upper secondary education in our next study. Thus, I will be able to continue to make research about the labour market position of this group. I am also applying for additional funding for this project. This project can also be considered to be a continuation of cooperation of members of the Newskills project.

The difficult situation on the labour market for young women without further education and training have also interested the media. My study was on the front page of *Dagen Nyheter* the 20th of January, the biggest daily paper of Sweden and the article was followed up in the news on the radio and TV. A question was also put to the Minister for Labour Market Affairs the same day about what the government are doing for these young women. I have also been contacted by a representative of a group from the union of local governments who are working with rehabilitating of people outside the labour market. A researcher from the labour union has also been in contact with me.

CEREQ Marseille

Prior dissemination : Bref article of Jean-Louis Kirsch n° 151 (March 1999) + its English version in Training and Employment n° 34 (Winter 98) . These results have been reported upon in Problèmes Economiques and in n° 15 of the Recueil d'études sociales janvier-avril 1999.

Exploitation : the work done in the project both in Jean-Louis' part but also in the cooperation we had with especially the Swedish colleagues has contributed to our "réflexion" on classifications (of training levels and specialties, on occupations, on sectors). It has allowed us to participate in the European seminar of LASMAS on "classifications".

Future plans : we are intending to hold a seminar in Céreq with guests from the various ministries, social partners and other researchers, at which we would invite our project partners to come and present the outcomes of their work. A publication in our series would follow.

CEPCEP Lisbon (Roberto Carneiro)

From our side we are still interested in running a Seminar in Lisbon, at the Catholic University, to discuss the major findings of the News Skills project with particular reference to some multicultural or multiethnic perspectives. As you know this has been a permanent area of inquiry in our approaches to education and labour market issues. Initially, we had intended to run this Seminar at the end of the current year. In view of some delays it was moved to 2000, perhaps end of 1st semester.

A second follow-up of our research is the following. I have applied for local research funds - a modest amount - to continue our research along the lines of our paper on Learning-by-Doing. There is a very high probability that we will be getting the funding. Fundamentally, we propose to work on an Innovation Function of Knowledge Stocks in Enterprises. We then propose to depart from those regressions to look further into learning patterns and environments in industry and services (NB. we shall be extending our scope to the tertiary sector).

6. ACKNOWLEDGEMENTS AND REFERENCES

(for NEWSKILLS research papers referred to in the text see APPENDIX 1 below)

Acemoglu, D. (1997) 'Technology, Unemployment and Efficiency,' *European Economic Review*, 41, 525-533.

Acemoglu, D. (1998) 'Why Do New Technologies Complement Skills? Directed Technical Change and Wage Inequality,' *Quarterly Journal of Economics*, 113, 1055-1089.

Altonji, J.G. and Spletzer, J.R. (1991) 'Worker Characteristics, Job Characteristics, and the Receipt of On-the-Job Training,' *Industrial and Labor Relations Review*, 45, 58-79.

Arulampalam, W. and Booth, A.L. (1997) 'Who Gets Over the Training Hurdle? A Study of the Training Experiences of Young Men and Women in Britain,' *Journal of Population Economics*, 10, 197-217.

Ashton, D., Davies, B., Felstead, A., and Green, F. (1999). *Work Skills in Britain*, Oxford: Centre for Skills, Knowledge and Organisational Performance.

Autor, D.H., Katz, L.F. and Krueger, A.B. (1998) 'Computing Inequality: Have Computers Changed the Labor Market?' *Quarterly Journal of Economics*, 113, 1169-1213..

Berman, E., Bound, J., and Griliches, Z. (1994). 'Changes in the Demand for Skilled Labor Within US Manufacturing: Evidence from the Annual Survey of Manufactures', *Quarterly Journal of Economics*, 109, 367-397.

Berman, E., Bound, J. and Machin, S. (1998) 'Implications of Skill-Biased Technological Change: International Evidence,' *Quarterly Journal of Economics*, 113, 1245-1279.

Bishop, J.H. (1989) 'Is the Test Score Decline Responsible for the Productivity Growth Decline?' *American Economic Review*, 79, 178-197.

Bishop, J.H. (1990) 'The Productivity Consequences of What is Taught in High School,' *Journal of Curriculum Studies*, 22, 101-126.

Bluestone, B. and Harrison, B. (1988), *The Great U-Turn: Corporate Restructuring and the Polarizing of America*, New York: Basic Books.

Blundell, R., Dearden, L. and Meghir, C. (1995) 'The Determinants and Effects of Work-Related Training in Britain, Institute for Fiscal Studies, mimeo.

Blau F and Kahn L (1996) 'International Differences in Male Wage Inequality: Institutions versus Market Forces,' *Journal of Political Economy*, 104, 791-837.

Booth, A.L (1991) 'Job-Related Formal Training: Who Receives it and What is it Worth?' *Oxford Bulletin of Economics and Statistics*, 53, 281-294.

Booth A.L. (1993) 'Private Sector Training and Graduate Earnings,' *Review of Economics and Statistics*, 75, 164-170.

Booth, A.L. and Satchell, S. (1994) 'Apprenticeships and Job Tenure,' *Oxford Economic Papers*, 46, 679-695.

Borjas, G.B. and Ramey, V.A. (1995) 'Foreign Competition, Market Power, and Wage Inequality,' *Quarterly Journal of Economics*, 110, 1075-1110.

Caroli, E. and Van Reenen, J. (1999) 'Skills and Organizational Change: Evidence from British and French establishments in the 1980s and 1990s,' Institute for Fiscal Studies Working Paper.

Crouch, C. (1997) 'Skills-Based Full Employment: the Latest Philosopher's Stone,' *British Journal of Industrial Relations*, 35, 367-391.

DiNardo, J.E. and Pischke, J. (1997) 'The Returns to Computer Use Revisited: Have Pencils Changed the Wage Structure Too?' *Quarterly Journal of Economics*, 112, 291-303.

Dolton, P. and Vignoles, A. (1997) 'The Impact of School Quality on Labour Market Success in the United Kingdom,' University of Newcastle-upon-Tyne, Discussion Papers in Economics number 97-03.

Dolton, P. and Vignoles, A. (forthcoming). 'The Incidence and Effects of Overeducation in the Graduate Labour Market,' *Economics of Education Review*, forthcoming.

Doyle, C. and Weale, M. (1994) 'Education, Externalities, Fertility and Economic Growth,' *Education Economics*, 2, 129-167.

Gallie, D. (1991) 'Patterns of Skill Change: Upskilling, Deskilling or the Polarization of Skills?' *Work, Employment and Society*, 5, 319-351

Gosling, A., Machin, S. and Meghir, C. (1994). 'The Changing Distribution of Male Wages in the UK, 1966-1992,' Institute of Fiscal Studies Working Paper no W94/13.

Green, F.(1993a) 'The Determinants of Training of Male and Female Employees in Britain,'*Oxford Bulletin of Economics and Statistics*, 55, 103-122.

Green, F. (1993b) 'The Impact of Trade Union Membership on Training in Britain,' *Applied Economics*, 25, 1033-1043.

Green, F. (1998) 'The Value of Skills,' University of Kent, Department of Economics Discussion Paper number 98/19.

Green, F., Felstead, A., and Gallie, D. (1998). 'Changing Skill-Intensity: An Analysis Based on Job Characteristics,' working paper.

Green, F., McIntosh, S. and Vignoles, A. (1999) 'Overeducation' and Skills - Clarifying the Concepts,' Centre for Economic Performance, London School of Economics Discussion Paper, forthcoming.

Greenhalgh, C.A. (1999) 'Adult Vocational Training and Government Policy in France and Britain,'*Oxford Review of Economic Policy*, vol. 15, forthcoming.

Greenhalgh, C.A. and Mavrotas, G. (1994) 'The Role of Career Aspirations and Financial Constraints in Individual Access to Vocational Training,' *Oxford Economic Papers*, 46, 579-604.

Greenhalgh, C.A. and Stewart, M.B. (1987) 'The Effects and Determinants of Training,' *Oxford Bulletin of Economics and Statistics*, 49, 171-189.

Gregg, P. and Machin, S. (1993), 'Is the Rise in UK Inequality Different?' in R. Barrell (ed.) *Is the British Labour Market Different?*, Cambridge: Cambridge University Press.

Grogger, J. and Eide, E. (1995) 'Changes in College Skills and the Rise in the College Wage Premium,' *Journal of Human Resources*, 30, 280-310.

Hartog, J. (1997). 'On Returns to Education: Wandering Along the Hills of ORU Land,' Keynote speech for the LVIIth Conference of the Applied Econometrics Association, Maastricht, May, 1997.

Haskel, J. (1999) 'Small Firms, Contracting-out, Computers and Wage Inequality: Evidence from UK Manufacturing,' *Economica*, 66, 1-21.

Haskel, J. (1996). 'The Decline in Unskilled Employment in UK Manufacturing,' Centre for Economic Policy Research, Discussion Paper No. 1356.

Heyes, J. (1993) 'Training Provision and Workplace Institutions: an Investigation,' *Industrial Relations Journal*, 24, 296-307.

Juhn, C. (1999) 'Wage Inequality and Demand for Skill: Evidence from Five Decades,' *Industrial and Labor Relations Review*, 52, 424-443.

Katz, L.F. and Murphy, K.M (1992), 'Changes in Relative Wages, 1963-1987: Supply and Demand Factors,' *Quarterly Journal of Economics*, 107, 35-78.

Kazamaki Ottersten E, Lindh T and Mellander E (1999) 'Evaluating Firm Training, Effects on Performance and Labour Demand' *Applied Economic Letters*, 6, 431-437.

Kennedy, J., Drago, R, Sloan, J. and Wooden, M. (1994) 'The Effect of Trade Unions on the Provision of Training: Australian Evidence,' *British Journal of Industrial Relations*, 32, 565-580.

Kenny, L.W., Lee, L. and Maddala, G.S. (1979) 'Returns to College Education: An Investigation of Self-Selection Bias Based on the Project Talent Data,' *International Economic Review*, 20, 775-789.

Knight, K.G. and Latreille, P.L. (1996) 'Apprenticeship Training and Day Release in UK Engineering: Some Cross-Sectional Evidence, *British Journal of Industrial Relations*, 34, 307-314.

Krueger, A.B. (1993) 'How Computers Have Changed the Wage Structure: Evidence from Microdata, 1984-1989, *Quarterly Journal of Economics*, 108, 33-60.

Levy, F. and Murnane, R. (1992), 'Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations,' *Journal of Economic Literature*, 30, 1333-1381.

Lillard, L.A. and Tan, H.W. (1992) 'Private Sector Training: Who Gets It and What are its Effects'? *Research in Labor Economics*, 13, 1-62.

Lloyd-Ellis, H. (1999) 'Endogenous Technological Change and Wage Inequality,' *American Economic Review*, 89, 47-77.

Lowenstein, M.A. and Spletzer, J.R. (1997) 'Delayed Formal On-the-Job Training,' *Industrial and Labor Relations Review*,' 51, 82-99.

Lynch, L.M.(1992) 'Private-Sector Training and the Earnings of Young Workers,' *American Economic Review*, 82, 299-312.

Machin, S. (1996) 'Changes in the Relative Demand for Skills in the UK Labor Market' in Booth, A. and Snower, D.J. (eds) *Acquiring Skills: Market Failures, Their Symptoms and Policy Responses*, Cambridge, Cambridge University Press.

Machin, S. and Van Reenen, J. (1998) 'Technology and Changes in Skill Structure: Evidence from Seven OECD Countries' *Quarterly Journal of Economics*, 113, 1215-1244.

Manacorda, M. and Manning, A. (1999). 'Just Can't Get Enough: More on Skill-Biased Change and Labour Market Performance', CEP Discussion Paper 412, Centre for Economic Performance, LSE

Morrison, C.J. (1997) 'Assessing the Productivity of Information technology equipment in U.S. Manufacturing Industries,' *Review of Economics and Statistics*, 79, 471-481.

Murnane, R.J., Willett, J.B. and Levy, F. (1995), 'The Growing Importance of Cognitive Skills in Wage Determination,' *Review of Economics and Statistics*, 77, 251-266.

Murphy, K.M. and Welch, F. (1992), 'The Structure of Wages,' *Quarterly Journal of Economics*, 107, 285-326.

Nickell, S. and Bell, B. (1996) 'Changes in the Distribution of Wages and Unemployment in OECD Countries,' *America Economic Review*, 86, 302-308.

OECD (1994) *The Jobs Study: Evidence and Explanations Part I Labour Market Trends and Underlying Forces of Change* OECD, Paris

OECD (1997a) 'Lifelong Investment in Human Capital' in *Education Policy Analysis*, OECD, Paris

OECD(1997b) 'Literacy skills: use them or lose them' in *Education Policy Analysis*, OECD, Paris

OECD (1997c) *Employment Outlook*, Paris.

Oosterbeek, H. (1997) 'Returns from Computer Use: a Simple Test on the Productivity Interpretation,' *Economic Letters*, 55, 273-277.

Robinson P (1997) 'Water Under the Bridge: Changes in Employment in Britain and the OECD' Centre for Economic Performance Discussion Paper No. 325

Rivera-Batiz, F.L. (1992) 'Quantitative Literacy and the Likelihood of Employment Among Young Adults,' *Journal of Human Resources*, 27, 313-328.

Saint-Paul, G. (1996) 'Are the Unemployed Unemployable,' *European Economic Review*, 40, 1501-1519.

Schmitt, J. (1995) 'The Changing Structure of Male Earnings in Britain, 1974-1988,' in R. Freeman and L. Katz (eds.) *Changes and Differences in Wage Structures*, Chicago: University of Chicago Press.

Simpson. D., Love, J. and walker, J. (1987) '*The Challenge of New Technology*, Brighton: Wheatsheaf Books.

Snower, D.J. (1996) 'The Low-Skill, Bad-Job Trap' in Booth, A. and Snower, D.J. (eds) *Acquiring Skills: Market Failures, Their Symptoms and Policy Responses*, Cambridge, Cambridge University Press.

Steedman H, A Green, O Bertrand, A Richter, M Rubin and K Weber (1997) *Assessment, Qualifications and Standards: the UK compared to France, Germany, Singapore and the US: A Technical Report* Centre for Economic Performance, March

Tan, H.W., Chapman, B., Peterson, C. and Booth, A.L. (1992) 'Youth Training in the US, Britain and Australia,' *Research in Labor Economics*, 13, 63-99.

Willis, R.J. and Rosen, S. (1979) 'Education and Self-Selection,' *Journal of Political Economy*, 87, S7-S37.

Wood. A. (1994) *North-South Trade, Employment and Inequality*, Oxford: Clarendon Press.

7. APPENDICES

APPENDIX 1: Complete list of papers produced for *NEWSKILLS* work programme

CEDEFOP (2000) *Agora IV The low-skilled on the European labour market: prospects and policy options - towards a minimum learning platform* CEDEFOP Panorama, Luxembourg [1]

Carneiro R and Conceiçào P (1999) 'Learning-by-Doing and Formalized Learning: A Case Study of Contrasting Development Patterns in Portuguese Industry' Working Paper 1009, Centre for Economic Performance, London School of Economics [2]

Houtkoop W (1999a) 'The Position of the Low-Skilled in Firms' Max Goote Centre, University of Amsterdam, mimeo [3]

Kazamaki Ottersten E (1997) 'Labour Demand: An Institutional Approach' Mimeo, The Research Institute of Industrial Economics, Stockholm [4]

Kazamaki Ottersten E (1998) 'Labour Market Conditions, Wage Bargaining and Education Policies: A Note' Mimeo, The Research Institute of Industrial Economics, Stockholm [5] (to follow)

Kazamaki Ottersten E, Lindh T and Mellander E (1999) 'Evaluating Firm Training, Effects on Performance and Labour Demand' *Applied Economic Letters*, 6, 431-437 [6]

Kirsch (1998) "Low Training Levels on European Labour Markets : Convergence and Contrasts", *Training and Employment* n° 34, Céreq, Marseille [7]

Kirsch (1999a) "Devenir des bas niveaux de qualification: comparaison des situations nationales" mimeo CEREQ, Marseille [8](to follow)

Kirsch (1999b) "Niveau de formation et marché du travail : l'Europe des contrastes", Bref n° 151, Céreq, Marseille [9]

Leuven E and Oosterbeek H (1997) "Demand and supply of work-related training: Evidence from four countries", Tinbergen Institute Discussion Papers 97-013/3 [10]

Leuven E, Oosterbeek H, and van Ophem H (1998a) "Explaining International Differences in Male Wage Inequality by Differences in Demand and Supply of Skill" Centre for Economic Performance Discussion Paper No. 392, May [11]

Leuven E and Oosterbeek H (1998b) " The Quality of New Jobs for the Low-Skilled in Europe" mimeo, Faculty of Economics, University of Amsterdam [12]

Leuven E and Oosterbeek H (1998c) "An Explicit Sharing Rule for Firm-specific Human Capital Investments" mimeo, Faculty of Economics, University of Amsterdam [13]

Leuven E and Oosterbeek H (1999) "Demand and supply of work-related training: Evidence from five countries (Results for the United Kingdom)" Mimeo [14]

Lages M (1997) 'The Output of the School System in Portugal: Facts, Figures and Issues' Mimeo, CEPCEP, Catholic University of Portugal, Lisbon [15]

Lages M (1998) 'Some Questions on the Differential Success of Portuguese Students' Mimeo, CEPCEP, Catholic University of Portugal, Lisbon [16]

McIntosh S (1998b) "The Demand for Post-Compulsory Education in Four European Countries" Centre for Economic Performance Discussion Paper No. 393, May [17]

McIntosh S (1998a) "Job quality in the United Kingdom, 1985-1995' Working Paper No. 981, Centre for Economic Performance, London School of Economics and Political Science [18]

McIntosh S (1999) 'A Cross-Country Comparison of the Determinants of Vocational Training' Centre for Economic Performance Discussion Paper No. 432, July [19]

Mellander (1999) 'The Multi-Dimensional Demand for Labour and Skill-Biased Technical Change' Mimeo, Industriens Utredningsinstitut, Stockholm [20]

Murray A and Steedman H (1999) "Growing Skills in Europe: the Changing Skill Profiles of France, Germany, the Netherlands, Portugal, Sweden and the UK" Centre for Economic Performance Discussion Paper No. 399, (Revised December 1999) [21]

Murray A (1997) 'Young People without an Upper Secondary Education in Sweden. Their home background, school and labour market experiences' *Scandinavian Journal of Educational Research*, Vol. 41, No. 2, [22]

Murray A (1999) 'Low-skilled Young People on the Labour Market in Sweden from the 1970s to the 1990s mimeo Stockholm Institute of Education; accepted for publication as 'Changes on the Labour Market for Young Adults without Further Education and Training' in the *Journal of Education and Work* (forthcoming) [23]

Steedman H (1999) "Looking into the Qualifications Black Box: What can International Surveys tell us about Basic Competence?" Discussion Paper No. 431 Centre for Economic Performance, London School of Economics and Political Science [24]

Steedman H (1999) 'Low Skills: How the Supply is Changing across Europe' in European Trends in Occupations and Qualifications, CEDEFOP, Luxembourg [25]

Houtkoop W (1999b) 'Progress towards a minimum learning platform in Europe' Max Goote Centre, University of Amsterdam, mimeo [26]

APPENDIX 2 : *NEWSKILLS* Project Participants

1. CO-ORDINATOR: Dr Hilary STEEDMAN
Centre for Economic Performance
London School of Economics & Political Science

2. Dr Steve MCINTOSH
As above

3. Professor Roberto CARNEIRO
Centro de Estudos dos Povos e Culturas de Expressao Portuguesa
Universidade Catolica Portuguesa
Lisboa

4. Dr Mario Ferreira LAGES
As above

5. Professor Willem HOUTKOOP
Max Goote Centre
Universiteit van Amsterdam
The Netherlands

6. Dr Hessel OOSTERBEEK
Faculty of Economics
University of Amsterdam
The Netherlands

7. Dr Edwin LEUVEN
As above

8. Dr Asa MURRAY
Stockholm Institute of Education
Department of Child and Youth Studies

9. Dr Erik MELLANDER
Industriens Utredningsinstitut
Stockholm S-114 85 Sweden

10. Dr. Eugenia Kazamaki OTTERSTEN
As Above

11 Ms Erika EKSTRÖM
As Above

12. Dr. Philippe MEHAUT
CEREQ
Marseille
France

13. Mme Annie BOUDER
As Above

14. Mr. Jean-Louis KIRSCH
As Above

APPENDIX 3: Seminars and conference papers given as part of the *NEWSKILLS* work programme

October 1996, European Commission, Brussels, 'New Job Skill Needs and the Low-Skilled' (Steven McIntosh and Hilary Steedman).

April 1997, EU seminar on Knowledge and Work, Amsterdam, 'Evaluating Firm Training, Effects on Performance and Labour Demand' (Erik Mellander).

May 1997, LVII International Conference of the Applied Econometrics Association, Maastricht, 'Evaluating Firm Training, Effects on Performance and Labour Demand' (Erik Mellander).

June 1997, CIRETOQ meeting, CEDEFOP, Thessaloniki, 'New Job Skill Needs and the Low-Skilled' (Eugenia Kazamaki Ottersten and Steven McIntosh).

January 15-16 1998, Comparative Vocational Education and Training Research in Europe Approaches, policy links and innovation transfer. Conference in the Wissenschafts-zentrum, Bonn, 'Skill Profiles and Skill Formation in six EU countries' (Asa Murray and Hilary Steedman).

May 1998, Centre for Economic Performance, London School of Economics, 'The Demand for Post-compulsory Education in Four European Countries' (Steven McIntosh).

June 15-16, Joint Conference on Vocational Education and Training, organised by DGXII and CEDEFOP, held at CEDEFOP, Thessaloniki, 'New Job Skill Needs and the Low-Skilled' (Eugenia Kazamaki Ottersten).

October 1998, Centre for Economic Performance, London School of Economics, 'Job Quality in the United Kingdom, 1985-1995' (Steven McIntosh).

October 29-30 1998, Agora IV CEDEFOP, Thessaloniki, 'Summary of Findings of *NEWSKILLS* Project' (Eugenia Kazamaki Ottersten).

October 29-30 1998, Agora IV CEDEFOP, Thessaloniki, 'Achieving a Minimum Learning Platform For All' (Roberto Carneiro).

October 29-30 1998, Agora IV CEDEFOP, Thessaloniki, 'New Job Skill Needs and the Low-Skilled' (Hilary Steedman).

October 29-31 1998, European Evaluation Society, International Conference on Evaluation: Profession, Business or Politics, Rome, 'A Comparative Study of Low Skills in the Population' (Asa Murray).

November 13 1998, Centre for Economic Performance, London School of Economics, 'Estimation of Labour Demand Functions by Sector and Skill Level: Sweden 1985-1994' (Erik Mellander).

November 27 1998, Centre for Economic Performance, London School of Economics, 'Learning-by-doing and Formalised Learning: A Case Study of Contrasting Industrial Development Patterns in Portuguese Industry' (Roberto Carneiro).

May 4 1999, Centre for Economic Performance, London School of Economics, 'Looking Into the Qualifications 'Black Box': What Can International Surveys Tell Us About Basic Competence?' (Hilary Steedman).

May 31 1999, Research Institute of Industrial Economics, Stockholm, 'The Multi-dimensional Nature of Labour Demand and Skill-biased Technical Change' (Erik Mellander).

June 7 1999, The Institute for Health Economics, Lund, Sweden, 'The Multi-dimensional Nature of Labour Demand and Skill-biased Technical Change' (Erik Mellander).

July 13 1999, Portuguese labour Ministry, Lisbon. 'Trends and Challenges - Learning and Working in the 21st Century' (Roberto Carneiro).

July 14-16 1999, European Conference of the Journal of Vocational Education and Training, Manchester, 'Changing Skills Profiles of France, Germany, the Netherlands, Portugal, Sweden and the UK' (Hilary Steedman)

September 15 1999, vaxjo University, Vaxjo, Sweden, 'The Multi-dimensional Nature of Labour Demand and Skill-biased Technical Change' (Erik Mellander).

September 22-25 1999, European Conference on Educational Research, Lahti, Finland, 'Changes on the Labour Market for Young Adults with and Without Vocational Training' (Asa Murray).

September 23-26 1999, European Association of Labour Economists Conference, Regensburg, 'Job Quality in the United Kingdom, 1985-1995' (Steven McIntosh).

September 30 1999, Social Research Institute, Stockholm University, 'The Multi-dimensional Nature of Labour Demand and Skill-biased Technical Change' (Erik Mellander).

October 19 1999, Centre for Economic Performance, London School of Economics, 'A Cross-country Comparison of the Determinants of Vocational Training' (Steven McIntosh).

APPENDIX 4

DELIVERABLES AND WORK PLANNING/SCHEDULE	
WITHIN 6 MONTHS OF PROJECT START DATE	
Project 1	Achieved
Establish broad equivalences of qualification categories used in data collection for Labour Force Survey of the EU countries to be studied.	Yes
Project 2 Complete collection of data on flows of main educational qualifications in countries to be studied over a 10-15 year time period to 1995	Yes
Project 3 Organisation of collection of curriculum materials, syllabuses, test papers etc., from the five participating EU member states and for Germany – further EU countries to be added where feasible. The study will concentrate on three main levels of initial education (a) end compulsory education, (b) end upper secondary vocational education, and (c) end upper secondary non-vocational education in a chosen selection of subject areas. Arrangement for translation of papers where necessary. Copying and classification of materials.	Modified and replaced by collection and analysis of data from Third International Mathematics Study (see 12 month Progress Report 7/03/97)
WITHIN 9 MONTHS OF PROJECT START DATE	
Project 1 Investigate comparability of occupational classifications across EU countries included in the study and, as far as is feasible, produce standard classifications for employment by 4 or 5 broad skill levels. Produce tables showing changes in the educational composition of the labour force by educational level, skill level, gender and age for a 10-15 year period up to the 1995 (where data available) for all EU countries to be studied. Collaborate with partners working on Project 2 to collect and standardise wage data for own countries.	Yes
Project 2	
Take the lead in collecting and standardising as far as is feasible wage data for own countries and at least two additional EU countries to be used in the study. Progress report prepared and circulated to all research team members	Yes
Project 3 Investigation and classification of assessment for chosen qualifications in member states. Investigation and classification of teacher qualifications, hours of study, subjects studied at different levels of education and training provision in the EU countries to be studied.	Modified and replaced by collection and analysis of data from Third International Mathematics Study (see Progress Report No.)

Project 1	
Develop a model for analysing the relationship of changes in wage differentials between unskilled and skilled active population which also takes account of changes in educational composition of the population. Produce report of year's work for discussion at full team meeting in Month 12.	Yes
Project 2	
Estimate equations to explain the evolution of educational participation, using wage data and data on flows of qualifications resulting from the first year's work.	Yes
Project 3	
Comparison of syllabuses of work covered, examination papers set and standards reached by those gaining the minimum educational and or vocational qualifications offered in the member states studied. Writing up of first draft of final project report. Draft report circulated for comment to all participants. Produce report of year's work for discussion at full team meeting in Month 12.	Modified and replaced by collection and analysis of data from Third International Mathematics Study (see Progress Report No.)
WITHIN 18 MONTHS OF PROJECT START DATE	
Projects 1, 2 Period of analysis, model development where applicable, writing up of first draft of Project Report. Draft report circulated for comment to all participants.	Yes
Project 3 Continue comparison of syllabuses of work covered, examination papers set and standards reached by those gaining the minimum educational and or vocational qualifications offered in the member states studied. Writing up of first draft of final project report. Draft report circulated for comment to all participants.	Modified and replaced by collection and analysis of data from Third International Mathematics Study (see Progress Report No.)
WITHIN 24 MONTHS OF PROJECT START DATE	
Projects 1,2,3 Final written report of Projects 1,2,3, produced in typescript and circulated to all participants. Hold conference for policy-makers to present findings of Projects 1,2,3, and to seek views on Project 4.	Yes
Project 4 Project leader consults with participants and produces plan for field work and semi-structured interviews.	Yes
WITHIN 30 MONTHS OF PROJECT START DATE	
Project 4 Complete literature review and interviews for Project 4.	Part-achieved Field work carried out in 3/5 countries
WITHIN 33 MONTHS OF PROJECT START DATE	
Final draft report prepared for Project 4 and circulated to all participants.	Yes
Estimates prepared by Project 3 partners of percentage in each EU country which falls below the minimum learning platform level.	Yes
WITHIN 36 MONTHS OF PROJECT START DATE	
Final meeting of all participants to agree report of Project 4 and to analyse policy implications of the work of the participants over the previous three years. Report for Project 4 published in mimeo. Seminars/press conferences to be held in each participant country to publicise the work of the project, in particular the policy implications.	Yes Yes Seminars planned in UK, France and Portugal